SOIL SURVEY OF

Harrison County, Mississippi

United States Department of Agriculture
Soil Conservation Service and Forest Service
In cooperation with
Mississippi Agricultural and
Forestry Experiment Station

Major fieldwork for this soil survey was done in the period 1965–70. Soil names and descriptions were approved in 1971. Unless otherwise indicated, statements in the publication refer to conditions in the county in 1971. This survey was made cooperatively by the Soil Conservation Service, the Forest Service, and the Mississippi Agricultural and Forestry Experiment Station. It is part of the technical assistance furnished to the Harrison County Soil and Water Conservation District.

Either enlarged or reduced copies of the soil map in this publication can be made by commercial photographers, or they can be purchased on individual order from the Cartographic Division, Soil Conservation Service, United States Department of Agriculture, Washington, D.C. 20250.

HOW TO USE THIS SOIL SURVEY

THIS SOIL SURVEY contains information that can be applied in managing farms, ranches, and woodlands; in selecting sites for roads, ponds, buildings, and other structures; and in judging the suitability of tracts of land for farming, industry, and recreation.

Locating Soils

All the soils of Harrison County are shown on the detailed map at the back of this publication. This map consists of many sheets made from aerial photographs. Each sheet is numbered to correspond with a number on the Index to Map Sheets.

On each sheet of the detailed map, soil areas are outlined and are identified by symbols. All areas marked with the same symbol are the same kind of soil. The soil symbol is inside the area if there is enough room; otherwise, it is outside and a pointer shows where the symbol belongs.

Finding and Using Information

The "Guide to Mapping Units" can be used to find information. This guide lists all the soils of the county in alphabetic order by map symbol and gives the capability classification of each. It also shows the woodland group for each soil and the page where each soil is described.

Individual colored maps showing the relative suitability or degree of limitation of soils for many specific purposes can be developed by using the soil map and the information in the text. Translucent material can be used as an overlay over the soil map and colored to show soils that have the same limitation or suitability. For example, soils that have a slight limitation for a given use can be colored green, those with a moderate limitation can be colored yellow, and those with a severe limitation can be colored red.

Farmers and those who work with farmers can learn about use and management of the soils from the soil descriptions and from the descriptions of the woodland groups.

Foresters and others can refer to the section "Use of the Soils for Woodland," where the soils of the county are grouped according to their suitability for trees.

Game managers, sportsmen, and others can find information about soils and wildlife in the section "Use of the Soils for Wildlife."

Community planners and others can read about soil properties that affect the choice of sites for nonindustrial buildings and for recreation areas in the section "Town and Country Planning."

Engineers and builders can find, under "Engineering Uses of the Soils," tables that contain test data, estimates of soil properties, and information about soil features that affect engineering practices.

Scientists and others can read about how the soils formed and how they are classified in the section "Formation and Classification of the Soils."

Newcomers in Harrison County may be especially interested in the section "General Soil Map," where broad patterns of soils are described. They may also be interested in the section "Environmental Factors Affecting Use of the Soil."

Cover: **Longleaf pine on Harleston fine sandy loam, 2 to 5 percent slopes.**

Contents

Issued June 1975

SOIL SURVEY OF HARRISON COUNTY, MISSISSIPPI

BY WILLIAM I. SMITH, SOIL CONSERVATION SERVICE

FIELDWORK BY WILLIAM I. SMITH AND L. B. HALE, SOIL CONSERVATION SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE AND FOREST SERVICE, IN COOPERATION WITH THE MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION

HARRISON COUNTY is in the extreme southern part of Mississippi (fig. 1). It adjoins the Mississippi Sound in the Gulf of Mexico to the south, Jackson County to the east, Stone County to the north, and Hancock County to the west. The total area of the county is 374,528 acres, or about 585 square miles, including Deer, Ship, and Cat Islands. The mainland part of the county is approximately 29 miles from east to west and approximately 25 miles, at the widest point, from north to south. The Wolf, Biloxi, and Tchoutacabouffa Rivers drain most of the county. They are roughly parallel, each flowing from northwest to southeast, and curving to the southwest near the mouth. A few small areas drain directly into the Mississippi Sound, Biloxi Bay, or St. Louis Bay.

Harrison County has two county seats. Gulfport, in the south-central part, is the seat of most county services, but Biloxi serves much of the southeastern part of the county.

About 108,000 acres of the county is within the DeSoto National Forest. About 61,000 acres of this tract is federally owned. The rest is privately owned, or is sixteenth-section land owned by the State. Keesler Air Force Base is located in Biloxi, and the U.S. Naval Construction Batallion (Sea Bee) Center is located in Gulfport.

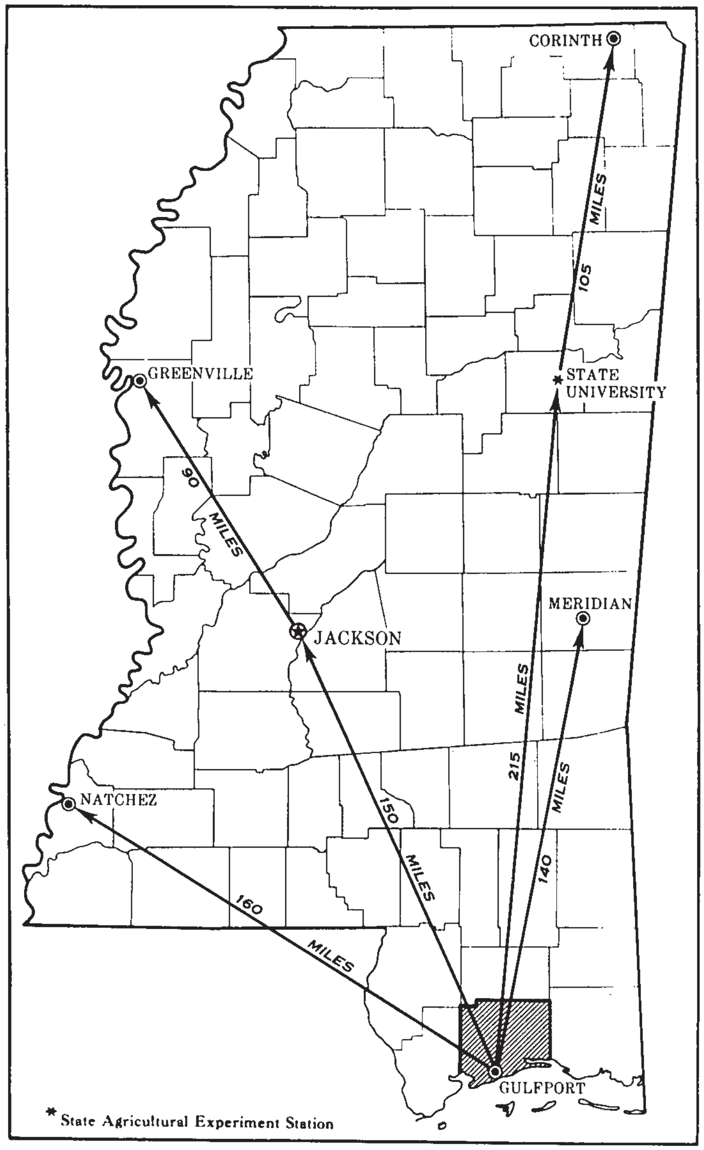

Figure 1.—Location of Harrison County in Mississippi.

How This Survey Was Made

Soil scientists made this survey to learn what kinds of soil are in Harrison County, where they are located, and how they can be used. The soil scientists went into the county knowing they likely would find many soils they had already seen and perhaps some they had not. They observed the steepness, length, and shape of slopes, the size and speed of streams, the kinds of native plants or crops, the kinds of rock, and many facts about the soils. They dug many holes to expose soil profiles. A profile is the sequence of natural layers, or horizons, in a soil; it extends from the surface down into the parent material that has not been changed much by leaching or by the action of plant roots.

The soil scientists made comparisons among the profiles they studied, and they compared these profiles with those in counties nearby and in places more distant. They classified and named the soils according to nationwide, uniform

procedures. The *soil series* and the *soil phase* are the categories of soil classification most used in a local survey.

Soils that have profiles almost alike make up a soil series. Except for different texture in the surface layer, all the soils of one series have major horizons that are similar in thickness, arrangement, and other important characteristics. Each soil series is named for a town or other geographic feature near the place where a soil of that series was first observed and mapped. Poarch and Ruston, for example, are the names of two soil series. All the soils in the United States having the same series name are essentially alike in those characteristics that affect their behavior in the undisturbed landscape.

Soils of one series can differ in texture of the surface soil and in slope, stoniness, or some other characteristic that affects use of the soils by man. On the basis of such differences, a soil series is divided into phases. The name of a soil phase indicates a feature that affects management. For example, Poarch fine sandy loam, 2 to 5 percent slopes, is one of several phases within the Poarch series.

After a guide for classifying and naming the soils had been worked out, the soil scientists drew the boundaries of the individual soils on aerial photographs. These photographs show woodlands, buildings, field borders, trees, and other details that help in drawing boundaries accurately. The soil map in the back of this publication was prepared from the aerial photographs.

The areas shown on a soil map are called mapping units. On most maps detailed enough to be useful in planning the management of farms and fields, a mapping unit is nearly equivalent to a soil phase. It is not exactly equivalent, because it is not practical to show on such a map all the small, scattered bits of soil of some other kind that have been seen within an area that is dominantly of a recognized soil phase.

Some mapping units are made up of soils of different series, or of different phases within one series. Three such kinds of mapping units are shown on the soil map of Harrison County: soil complexes, soil associations, and undifferentiated groups.

A soil complex consists of areas of two or more soils, so intermingled or so small in size that they cannot be shown separately on the soil map. Each area of a complex contains some of each of the two or more dominant soils, and the pattern and relative proportions are about the same in all areas. The name of a soil complex consists of the names of the dominant soils, joined by a hyphen. Saucier-Susquehanna complex, 2 to 5 percent slopes, is an example.

A soil association is made up of adjacent soils that occur as areas large enough to be shown individually on the soil map but are shown as one unit because the time and effort of delineating them separately cannot be justified. There is a considerable degree of uniformity in pattern and relative extent of the dominant soils, but the soils may differ greatly one from another. The name of an association consists of the name of the dominant soil (or soils, in which case the names are joined by hyphen). Handsboro association is an example in this survey.

An undifferentiated group is made up of two or more soils that could be delineated individually but are shown as one unit because, for the purpose of the soil survey, there is little value in separating them. The pattern and proportion of soils are not uniform. An area shown on the map may be made up of only one of the dominant soils, or of two or more. The name of an undifferentiated group consists of the names of the dominant soils, joined by "and." Saucier, Smithton, and Susquehanna soils, rolling, is an example.

In most areas surveyed there are places where the soil material is so rocky, so shallow, or so severely eroded that it cannot be classified by soil series. These places are shown on the soil map and are described in the survey, but they are called land types and are given descriptive names. Coastal beach is a land type in Harrison County.

While a soil survey is in progress, samples of soils are taken, as needed, for laboratory measurements and for engineering tests. Laboratory data from the same kinds of soil in other places are assembled. Data on yields of crops under defined practices are assembled from farm records and from field or plot experiments on the same kinds of soil. Yields under defined management are estimated for the arable soils.

Soil scientists observe how soils behave when used as a growing medium for native and cultivated plants and as material for structures, foundations for structures, or covering for structures. They relate this behavior to properties of the soils. For example, they observe that filter fields for onsite disposal of sewage fail on a given kind of soil, and they relate this to slow permeability or a high water table. They see that streets, road pavements, and foundations for houses crack on a given kind of soil, and they relate this failure to a high shrink-swell potential. Thus, they use observation and knowledge of soil properties, together with available research data, to predict the limitations or suitability of a soil for present and potential uses.

After data have been collected and tested for the key, or benchmark, soils in a survey area, the soil scientists set up trial groups of soils. They test these groups by further study and by consultation with farmers, agronomists, engineers, and others. They then adjust the groups according to the results of their study and consultation. Thus, the groups that are finally evolved reflect up-to-date knowledge of the soils and their behavior under current methods of use and management.

General Soil Map

The general soil map at the back of this survey shows, in color, the soil associations in Harrison County. A soil association is a landscape that has a distinctive proportional pattern of soils. It normally consists of one or more major soils and at least one minor soil, and it is named for the major soils. The soils in one association may occur in another, but in a different pattern.

A map showing soil associations is useful to people who want a general idea of the soils in a county, who want to compare different parts of a county, or who want to know the location of large tracts that are suitable for a certain kind of land use. Such a map is a useful general guide in managing a watershed, a wooded tract, or a wildlife area, or in planning engineering works, recreational facilities, and community developments. It is not a suitable map for planning the management of a farm or field, or for selecting the exact location of a road, building, or similar structure, because the soils in any one association ordinarily differ in slope, depth, stoniness, drainage, and other characteristics that affect their management.

The soil associations in Harrison County are discussed on the following pages.

Sandy Soils on Uplands

The soils of this group are dominantly on broad ridgetops and smooth side slopes. Slopes are dominantly 0 to 5 percent.

1. Eustis-Latonia-Lakeland association

Somewhat excessively drained and excessively drained soils that are sandy throughout and well-drained soils that have a loamy subsoil

This association is a long broad area that is cut by narrow shallow drains. It is just north of the Mississippi Sound. It is approximately 2 miles wide in Biloxi and tapers to approximately one-half mile wide at Pass Christian. The system of narrow drains mostly parallels the shoreline of the Mississippi Sound. Areas between the drains are remnants of old beaches.

This association makes up about 10 percent of the county. It is about 50 percent Eustis soils (fig. 2), 23 percent Latonia soils, 5 percent Lakeland soils, and 22 percent Harleston, Plummer, and Ocilla soils and Coastal beach.

Eustis soils are somewhat excessively drained and have a loamy sand surface layer and a loamy sand subsoil. Latonia soils are well drained. They have a loamy sand surface layer and a sandy loam subsoil. Lakeland soils are excessively drained and have a fine sand surface layer and fine sand underlying layers.

Most of this association has been developed for residential or commercial use. Many areas, however, are wooded or idle. Residential and commercial development continues in many areas.

This association is suited to lawn grasses, ornamental shrubs, truck crops, and pine and live oak trees. The soils are droughty. For residential, commercial, or recreational development, the limitations are slight to severe.

Loamy and Sandy Soils on Broad Flats and Flood Plains

The soils of this group generally are wet for long periods, especially in winter and spring. Slopes are dominantly 0 to 5 percent.

2. Smithton-Plummer association

Poorly drained soils that have a loamy subsoil

This association (fig. 3) is on broad flats and in drainageways and depressional areas in the southern part of the county. The areas are about one-fourth mile to more than 1 mile wide, several miles long, and irregular. Several areas of better drained soils are on low ridges. Most areas in this association are flooded or have water standing on the surface for long periods.

This association makes up about 10 percent of the county. It is about 60 percent Smithton soils, 30 percent Plummer soils, and 10 percent Hyde and Poarch soils.

Smithton soils are poorly drained. They have a fine sandy loam surface layer and subsoil. The Plummer soils also are poorly drained. They have a thick loamy sand surface layer and a sandy loam subsoil.

Most of the association is used for trees or is idle. Near the cities many areas have been drained and are used for residential or commercial building sites. Much of the

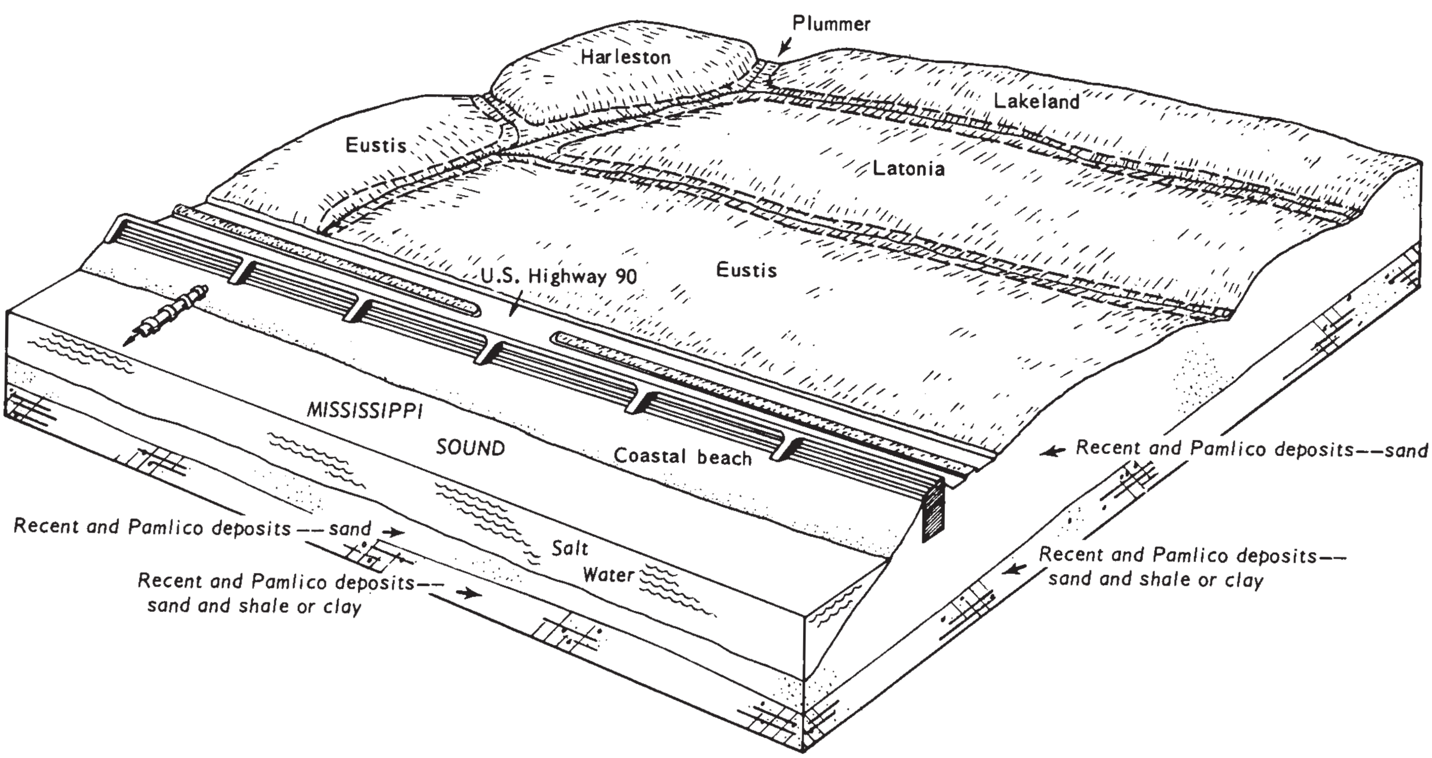

***Figure 2.*—Distribution and pattern of major soils in Eustis-Latonia-Lakeland association.**

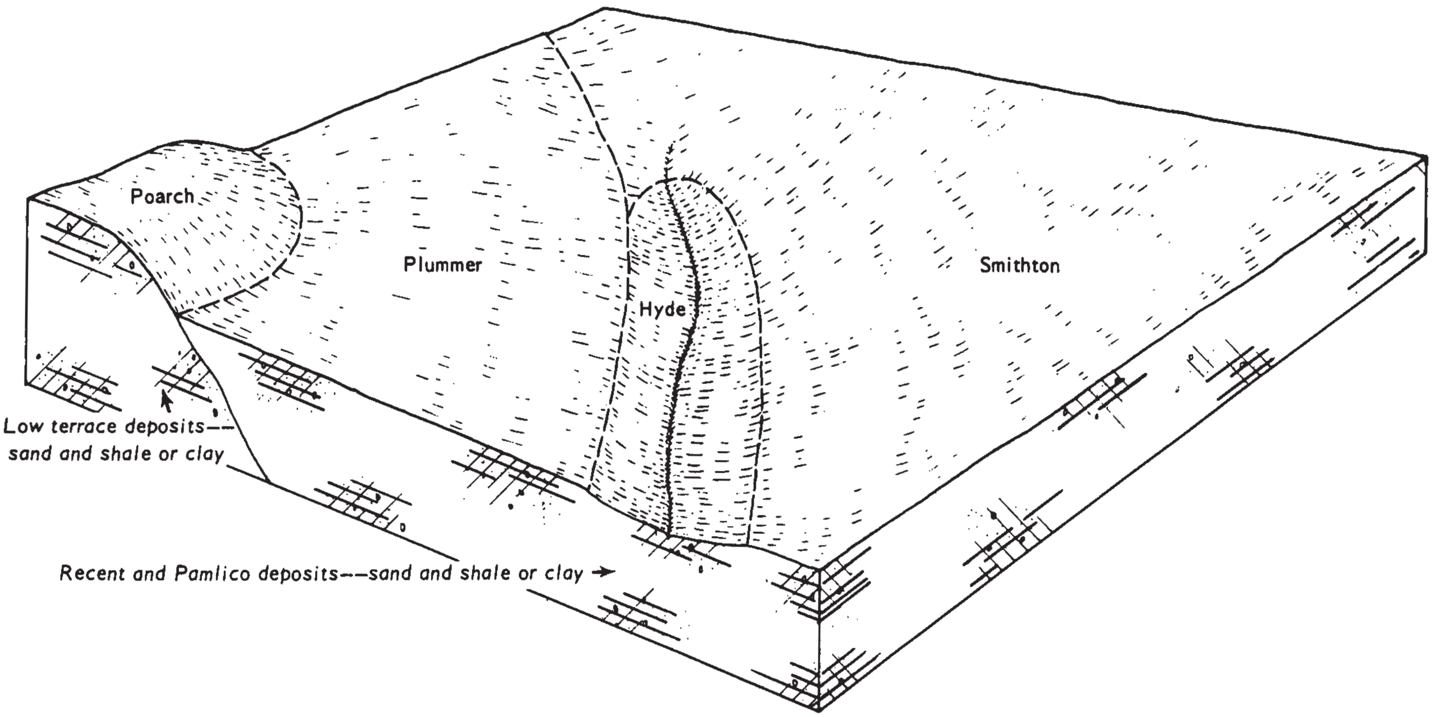

Figure 3.—**Distribution and pattern of major soils in Smithton-Plummer association.**

wooded area is in stands of slash pine. The size of individual tracts ranges from small residential lots to commercial tree farms hundreds of acres in size.

If adequately drained this association is suited to lawn grasses, ornamental shrubs, pasture plants, and pine trees. Use of the soils for residential, commercial, or recreational development is severely limited by a seasonal high water table, frequent flooding, or low bearing value.

3. Atmore-Harleston-Plummer association

Poorly drained and moderately well drained soils that have a loamy subsoil

This association (fig. 4) is on broad nearly level flats that are broken by scattered drainageways and numerous low ridges where the soils are gently sloping. It is in the southern part of the county. Many of the ridges are narrow, and most are less than one-fourth mile wide.

This association makes up about 4 percent of the county. It is about 55 percent Atmore soils, 15 percent Harleston soils, 5 percent Plummer soils, and 25 percent Latonia, Poarch, Ocilla, and Escambia soils.

Atmore soils are on the broad flats and in drainageways and depressional areas. They are poorly drained and have a silt loam surface layer and a subsoil that is silt loam in the upper part and becomes clayey with depth. Harleston soils are on the low ridges. They are moderately well drained and have a fine sandy loam surface layer and subsoil. The Plummer soils are poorly drained and have a thick loamy sand surface layer and a sandy loam subsoil.

Much of this association is in stands of slash pines or is idle. Many areas have been drained and are used for building sites, especially in areas near the cities. The size of individual tracts ranges from small residential lots to large commercial tree farms.

If adequately drained this association is suited to lawn grasses, ornamental shrubs, pasture plants, and pine trees. Use of the soils for residential, commercial, or recreational development is severely limited in most areas by a seasonal high water table or flooding.

4. Poarch-Plummer-Ocilla association

Well-drained, somewhat poorly drained, and poorly drained soils that have a loamy subsoil

This association is on a landscape of low relief consisting of broad gently sloping ridges and flat wet areas. These low areas are less than one-fourth mile wide.

This association makes up about 3 percent of the county. It is about 35 percent Poarch soils, 20 percent Plummer soils, 20 percent Ocilla soils, and 25 percent Latonia, Harleston, Eustis, and Smithton soils.

Poarch soils are on the broad low ridges. They are well drained and have a fine sandy loam surface layer and subsoil. Plummer soils are on narrow wet flats and in drainageways. They are poorly drained and have a loamy sand surface layer and a sandy loam subsoil. The Ocilla soils are on slightly higher flats that have better drainage than the Plummer soils. They are somewhat poorly drained and have a loamy sand surface layer and a sandy loam subsoil.

Much of this association has been developed for residential or commercial use. Many areas, however, are wooded, in pasture, or idle.

This association is suited to lawn grasses, ornamental shrubs, truck crops, row crops, and pine and live oak trees. On the well-drained soils, the limitations are slight for residential, commercial, and recreational development. Use

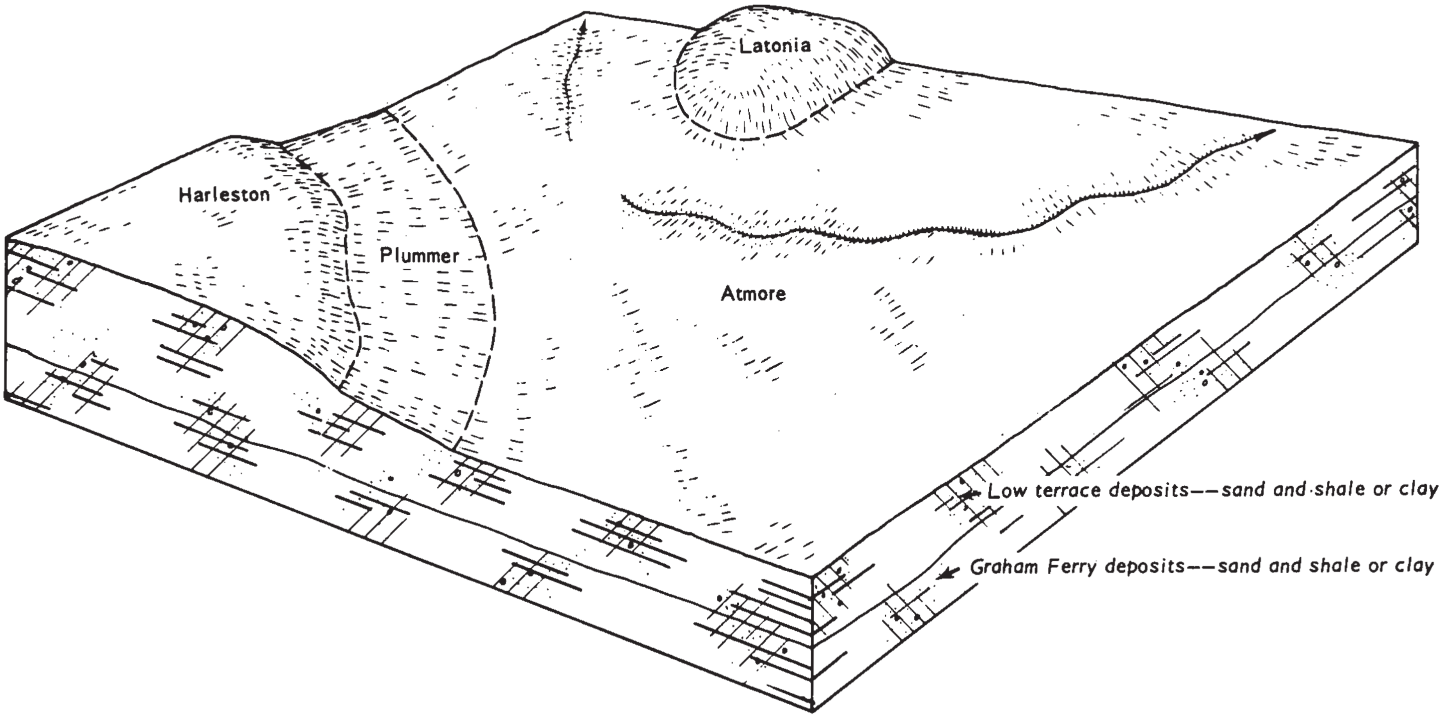

Figure 4.—Distribution and pattern of major soils in Atmore-Harleston-Plummer association.

of the low-lying soils is severely limited by a high water table and flooding.

5. Harleston-Smithton-Nugent association

Moderately well drained and poorly drained soils that have a loamy subsoil and excessively drained soils that are stratified with sandy and loamy material

This association is on flood plains and broad flats of streams upstream from the influence of brackish waters. It consists of the broad, low, densely wooded meander belts of the streams, including sand bars, narrow sloughs, and oxbow lakes and of the adjoining terraces at higher positions. In many areas the meander belt and adjoining terraces are separated by a steep, short escarpment. Areas are generally more than a quarter mile wide and several miles long.

This association makes up about 13 percent of the county. It is about 35 percent Harleston soils, 25 percent Smithton soils, 15 percent Nugent soils, and 25 percent Jena and Poarch soils.

Harleston soils are at the higher positions in the area and generally adjoin the meander belts. They are moderately well drained and have a fine sandy loam surface layer and subsoil. Smithton soils are at intermediate levels and are generally farthest from the stream channels. They are poorly drained, and have a fine sandy loam surface layer and a sandy loam subsoil. Nugent soils are dominant on the low meander belts. They are excessively drained and have a fine sandy loam or silt loam surface layer over stratified layers of fine sandy loam and loamy sand.

This association is used dominantly for trees. Much of the acreage is in mixed stands of hardwoods, bay, and slash pine. Nugent soils are densely wooded. Many summer cottages are built on the Harleston and Nugent soils at the higher elevations near navigable waters. The size of individual tracts ranges from summer cottage lots to commercial tree farms hundreds of acres in size.

Use of the soils for residential, commercial, or recreational development is severely limited by flooding.

Loamy Soils That Have a Loamy Subsoil, on Uplands

The soils of this group are dominantly on ridgetops and side slopes. Slopes range from 0 to 12 percent.

6. Poarch-Atmore-Harleston association

Well-drained soils on broad ridgetops, poorly drained soils on low wet flats, and moderately well drained soils on low ridges

This association is on broad ridgetops, short side slopes, and low wet flats (fig. 5). The ridges are a few hundred feet to about a half mile wide. The side slopes are short and are dominantly less than 12 percent. The low wet flats and drainageways are mostly less than a quarter mile wide.

This association makes up about 20 percent of the county. It is about 70 percent Poarch soils, 8 percent Atmore soils, 8 percent Harleston soils, and 14 percent Ruston and Saucier soils on the steeper side slopes.

Poarch soils are on the broad ridgetops and side slopes. They are well drained and have a fine sandy loam surface layer and a fine sandy loam subsoil. Atmore soils are on the low wet flats and in drainageways. They are poorly drained, have a silt loam surface layer, and are silt loam in the upper part of the subsoil. They become clayey with

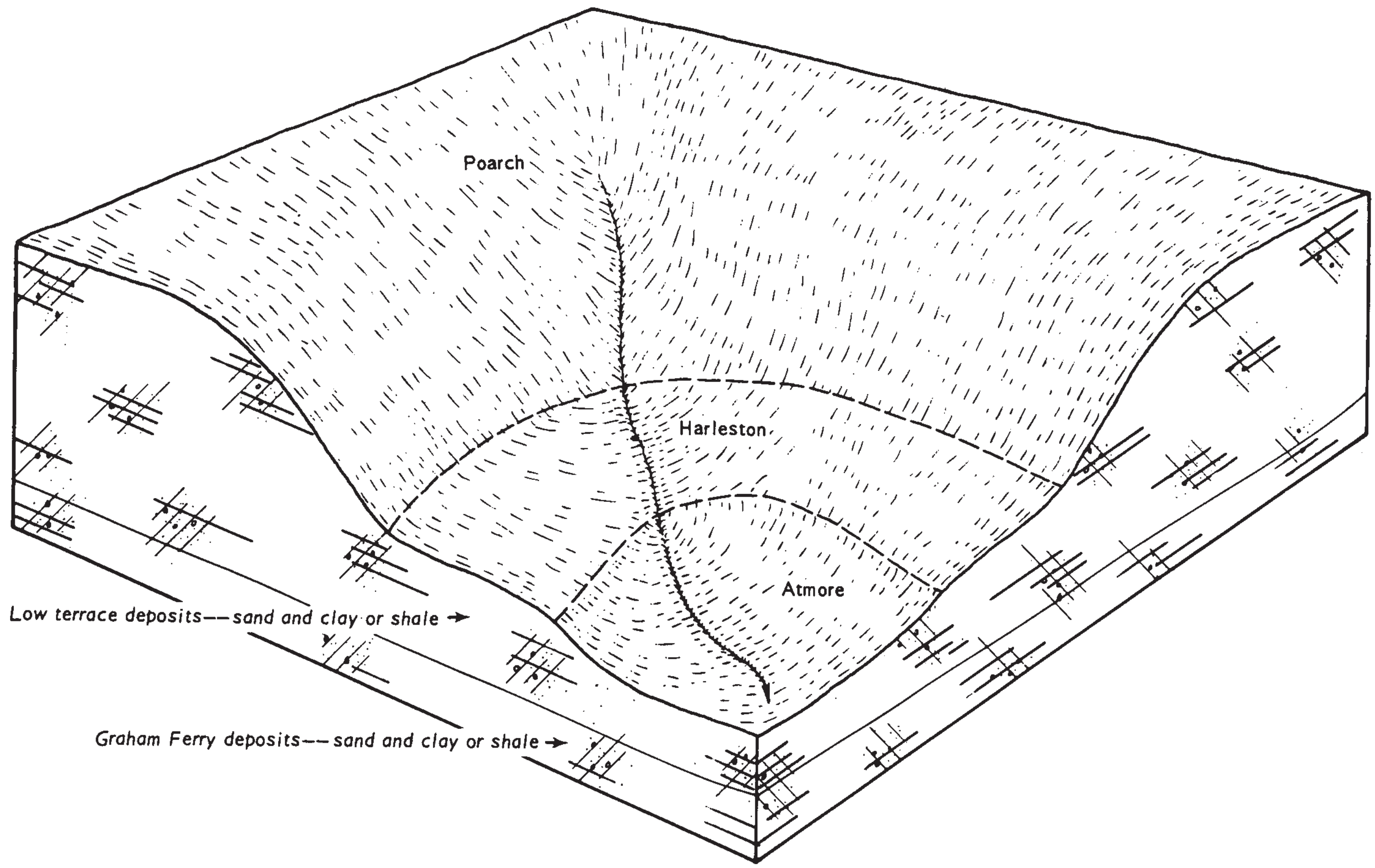

***Figure 5.*—Distribution and pattern of major soils in Poarch-Atmore-Harleston association.**

depth. Harleston soils are at intermediate levels. They are moderately well drained and their surface layer and subsoil are of fine sandy loam.

This association is used mostly for woodland and pasture. Much of the acreage is in longleaf pine or slash pine. Near the larger cities these areas are becoming more built-up by home builders and subdivision developers because of the favorable soil qualities. The size of individual tracts ranges from residential lots to commercial tree farms hundreds of acres in extent.

The broad ridges of this association are suited to lawn grasses, ornamental shrubs, truck crops, row crops, and pine trees. Use of the well-drained soils for residential, commercial, or recreational development is only slightly limited. However, use of the lower lying, wet, flat soils for these types of developments is severely limited by a high water table and flooding.

7. Ruston-McLaurin-Saucier association

Well drained and moderately well drained soils on broad ridges and short side slopes

This association is on long broad ridges and narrow side slopes. The ridges have slopes of less than 5 percent. Many side slopes are less than 250 feet wide. Stream bottoms are less than one-fourth mile wide; most are considerably less.

This association makes up about 20 percent of the county. It is about 40 percent Ruston soils, 19 percent McLaurin soils, 10 percent Saucier soils, and 31 percent Eustis, Atmore, and Harleston soils. Eustis soils are on the middle and lower side slopes and make up less than 10 percent of the association.

McLaurin and Ruston soils are on the broad ridgetops. They are well drained and have a fine sandy loam surface layer and a fine sandy loam to sandy clay loam subsoil. Saucier soils are on upper and lower side slopes. They are moderately well drained. Their surface layer is fine sandy loam. The upper part of the subsoil is loam and the lower part is plastic clay.

This association is used mostly for woodland and pasture. Much of this association supports stands of longleaf or slash pine. Along the major highways, several areas of Ruston and McLaurin soils have been developed as homesites. The size of individual tracts ranges from small residential lots to commercial tree farms of hundreds of acres.

The broad gently sloping ridges of this association are suited to lawn grasses, ornamental shrubs, truck crops, row crops, pasture, and pine trees. Limitations are slight for recreational, residential, or commercial development on Ruston and McLaurin soils. In sloping areas, limitations for these developments are moderate to severe, de-

pending on the steepness of slope and the hazard of erosion.

8. *Saucier-Poarch-Atmore association*

Well-drained to poorly drained soils on broad ridges and narrow side slopes

This association is on broad, gently sloping ridges (fig. 6) about 300 feet to one-fourth mile wide. The side slopes between the ridges are short, and most slopes are less than 12 percent. The stream bottoms are generally less than one-fourth mile wide.

This association makes up about 16 percent of the county. It is about 50 percent Saucier soils, 22 percent Poarch soils, 5 percent Atmore soils, and 23 percent Ruston, Plummer, Harleston, and Smithton soils.

Gently sloping Saucier soils are mostly on the ridges, and some areas are on the side slopes. They are moderately well drained. Their surface layer is fine sandy loam, the upper part of the subsoil is loam, and the lower part is plastic clay. Poarch soils also are mostly on the ridges and some side slopes. They are well drained and gently sloping. Their surface layer and subsoil are fine sandy loam. Atmore soils are on the low wet flats and in drainageways. They are poorly drained. Their surface layer is silt loam, and their subsoil is silt loam that becomes clayey with depth.

This association is used mostly for woodland and pasture. Stands of longleaf and slash pipe occupy much of the acreage. Near the cities and main highways, several areas have been developed as homesites. The size of individual tracts ranges from small residential lots to large tracts of timber of hundreds of acres.

The broad gently sloping ridges of this association are suited to lawn grasses, ornamental shrubs, truck crops, row crops, and pine trees. Limitations range from slight to moderate for residential, commercial, or recreational development. In sloping areas limitations for these developments are moderate to severe depending on the steepness of slope, the hazard of erosion, and the shrink-well properties of the clay subsoil.

Dominantly Organic Soils Flooded by Salt Water

The soils of this group are in low, broad, wet areas that are covered by salt or brackish water daily. The St. Lucie soils of the Handsboro-St. Lucie association are deep sandy soils that are not covered daily by salt water.

9. *Handsboro association*

Very poorly drained organic soils

This association is on broad, low, wet grassy flats (fig. 7) near bodies of salt or brackish water. These areas are along the Wolf River and its tributaries, along the Biloxi River and its tributaries, and along the Tchoutacabouffa River. Most of this association is flooded daily by brackish water.

This association makes up about 2 percent of the county. It is mostly Handsboro soils, which consist of well decomposed, fibrous, dominantly organic material over a thin mineral layer.

Many areas are idle; some are grazed. Each year the acreage used for grazing shrinks in size as a result of industrial development, spoil areas from construction of navigable waterways, and increased residential development.

This association is a suitable habitat for waterfowl, fish, and marsh animals.

For residential or commercial development, the limita-

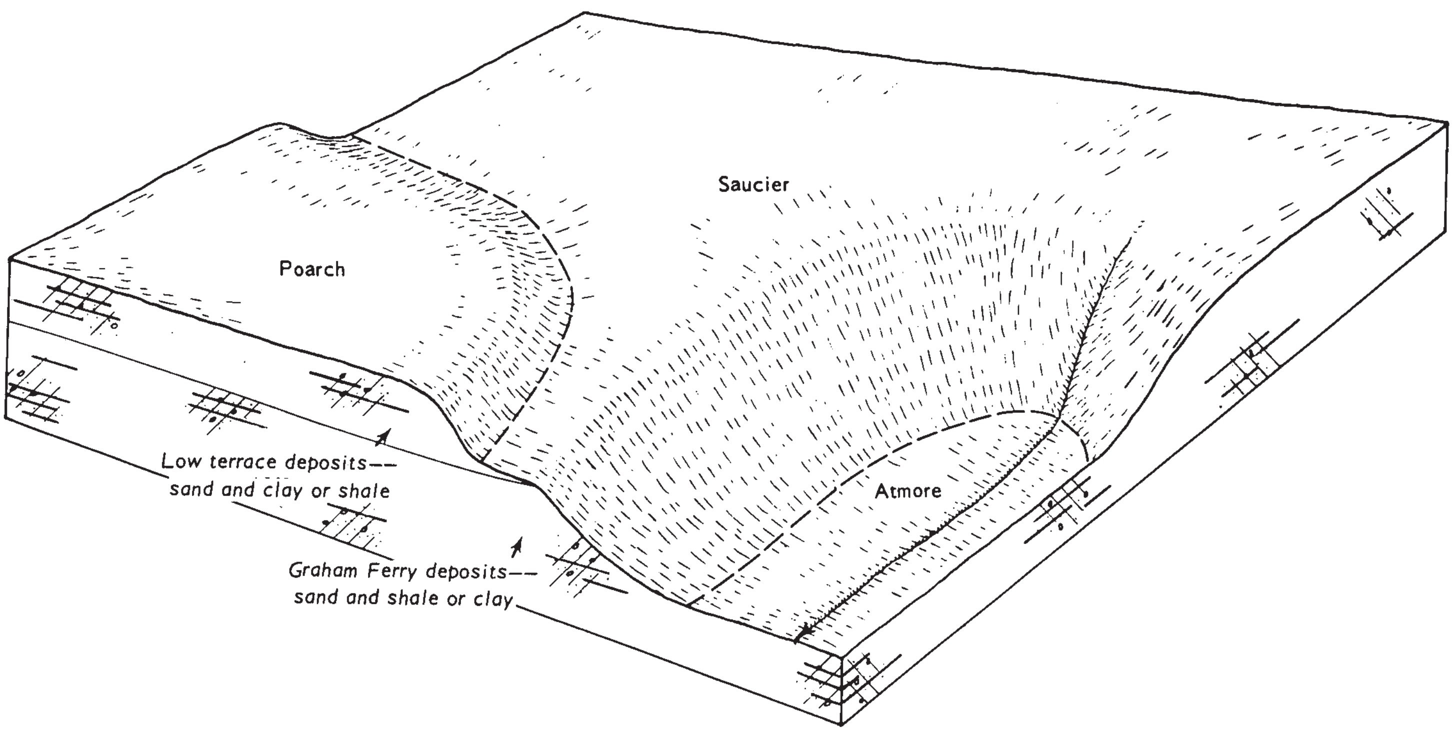

***Figure 6.*—Distribution and pattern of major soils in Saucier-Poarch-Atmore association.**

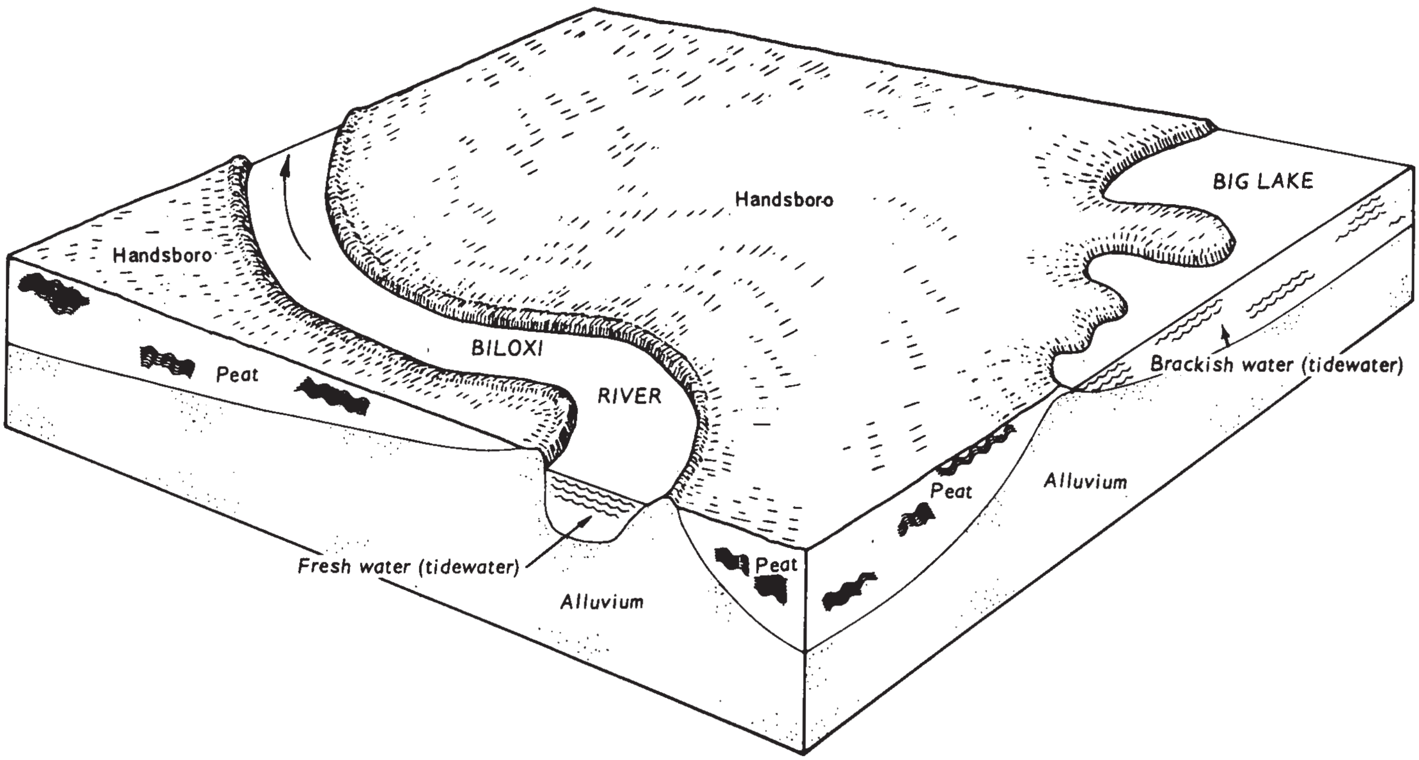

***Figure 7.*—Distribution and pattern of major soils in Handsboro association.**

tions are very severe. These limitations are caused by high water table, flooding, low bearing capacity, and high corrosion potential.

10. Handsboro-St. Lucie association

Very poorly drained organic soils and excessively drained sandy soils

This association is made up of Cat, Ship, and Deer Islands. Areas consist of wet, grassy flats that adjoin salt water at low elevations and are subject to tidal flooding and of wooded, sandy low ridges that are cut by long narrow drains, areas of sparsely vegetated sand dunes, and beaches (fig. 8).

This association makes up about 2 percent of the county. It is about 50 percent Handsboro soils, 25 percent St. Lucie soils, and 25 percent Coastal beach and Plummer soils.

Handsboro soils are very poorly drained. They formed in well decomposed fibrous organic material that has thin mineral layers. St. Lucie soils are excessively drained. They have a fine sand surface layer and a fine sand subsurface layer.

Much of this association is idle or is in stands of deformed or stunted trees. Subdivisions that have lots for summer homes and boating facilities occupy several areas of higher lying St. Lucie soils, and other areas are used for recreation.

This association is poorly suited to lawn grasses, ornamental shrubs, and pine and live oak trees. The soils are droughty. Soil blowing is a hazard where areas are bare and unprotected. Use of the association for residential, commercial, or recreational development is severely limited by flooding.

Descriptions of the Soils

This section describes the soil series and mapping units in Harrison County. Each soil series is described in considerable detail, and then, briefly, each mapping unit in that series. Unless it is specifically mentioned otherwise, it is to be assumed that what is stated about the soil series holds true for the mapping units in that series. Thus, to get full information about any one mapping unit, it is necessary to read both the description of the mapping unit and the description of the soil series to which it belongs.

An important part of the description of each soil series is the soil profile, that is, the sequence of layers from the surface downward to rock or other underlying material. Each series contains two descriptions of this profile. The first is brief and in terms familiar to the layman. The second, detailed and in technical terms, is for scientists, engineers, and others who need to make thorough and precise studies of soils. Unless it is otherwise stated, the colors given in the descriptions are those of a moist soil.

As mentioned in the section "How This Survey Was Made," not all mapping units are of a soil series. Coastal beach, for example, does not belong to a soil series, but nevertheless, is listed in alphabetic order along with the soil series.

Following the name of each mapping unit is a symbol in parentheses. This symbol identifies the mapping unit on the detailed soil map. Listed at the end of each description of a mapping unit is the capability unit and woodland group to which the mapping unit has been assigned. The page for the description of each mapping unit can be found

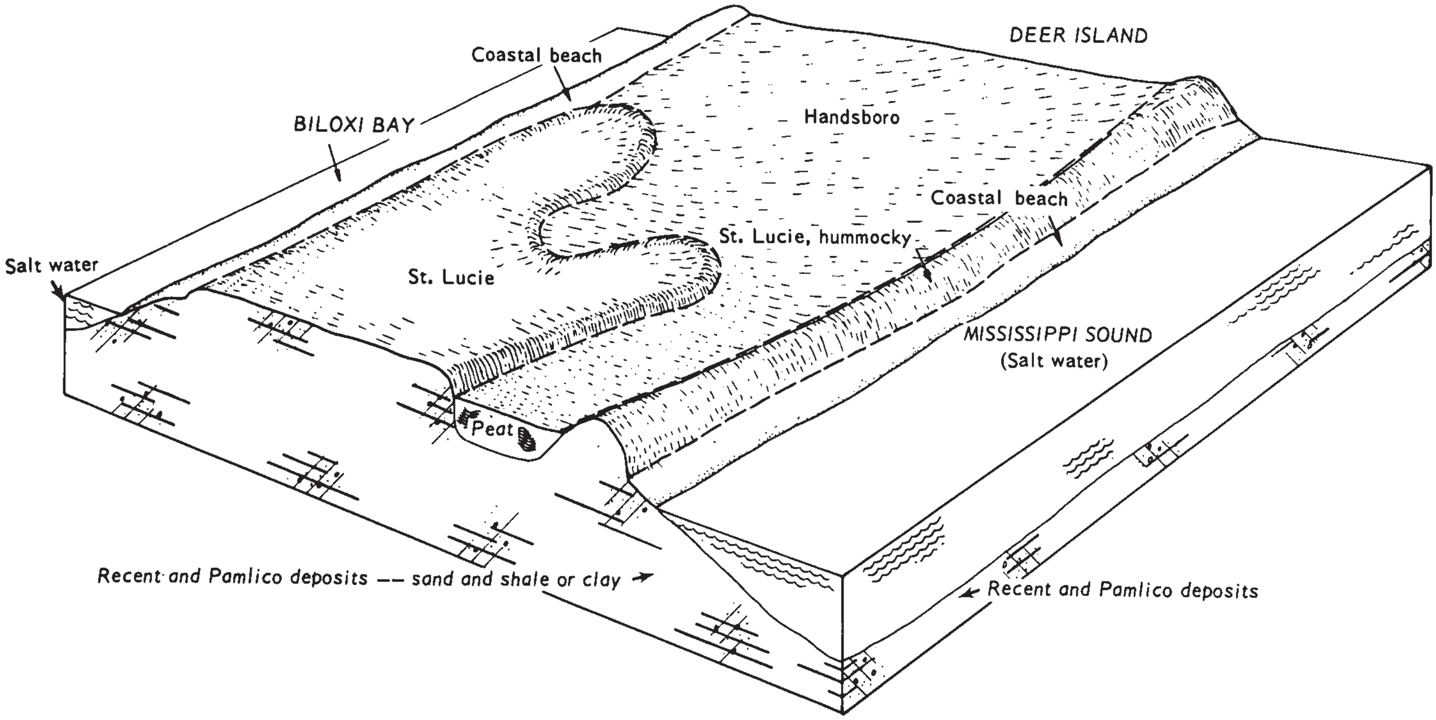

Figure 8.—**Distribution and pattern of major soils in Handsboro-St. Lucie association.**

by referring to the "Guide to Mapping Units" at the back of this survey.

The acreage and proportionate extent of each mapping unit are shown in table 1. Many of the terms used in describing soils can be found in the Glossary at the end of this survey, and more detailed information about the terminology and methods of soil mapping can be obtained from the Soil Survey Manual (*11*).[1]

Atmore Series

The Atmore series consists of poorly drained soils that formed in loamy material.

In a representative profile the surface layer is dark-gray silt loam about 5 inches thick. The next layer, 25 inches thick, is gray silt loam mottled with shades of brown. The subsoil, in sequence from the top, is 9 inches of dark-gray silt loam mottled in shades of brown; 12 inches of loam mottled with shades of gray, brown, and red; 8 inches of clay mottled with shades of gray, brown, and red; and 19 inches of clay loam mottled with shades of gray, brown, and red.

Representative profile of Atmore silt loam, 1 mile north of State Highway 67, along State Highway 15, and 90 yards west, SE¼NW¼ sec. 29, T. 6 S., R. 9 W.

A1—0 to 5 inches, dark-gray (10YR 4/1) silt loam; few, fine, distinct, strong-brown mottles; weak, fine, granular structure; very friable; common fine roots; very strongly acid; clear, smooth boundary.

A21g—5 to 9 inches, gray (10YR 5/1) silt loam; common, fine, distinct, light olive-brown mottles and few, fine, distinct, strong-brown mottles; weak, fine, granular structure; very friable; common fine roots; very strongly acid; clear, wavy boundary.

A22g&B—9 to 30 inches, gray (10YR 5/1) silt loam; many, medium and coarse, distinct, light olive-brown (2.5Y 5/4) mottles and few, fine, distinct, strong-brown mottles; weak, fine, granular structure; very friable; common fine roots; few pockets of uncoated sand grains; very strongly acid; gradual, irregular boundary.

B21tg—30 to 39 inches, dark-gray (10YR 4/1) silt loam; common, medium, distinct, light olive-brown (2.5Y 5/4) and yellowish-brown (10YR 5/6) mottles; weak, coarse, prismatic structure parting to weak, medium, subangular blocky structure; very friable, slightly plastic; common fine roots; bridging and coating of sand grains with clay; some pores coated with clay; common grayish pockets of uncoated sand grains; very strongly acid; clear, irregular boundary.

B22tg—39 to 51 inches, mottled light-gray (10YR 7/2), yellowish-brown (10YR 5/8), dark-red (10R 3/6) and dark-gray (10YR 4/1) loam; weak, coarse, prismatic structure parting to moderate, medium, subangular blocky structure; friable; strong-brown and dark-red parts are firm, brittle, and compact; common fine roots; thick dark-gray clay films on vertical ped faces; 15 to 20 percent soft plinthite nodules; many tongues of gray fine sandy loam within and between prisms; very strongly acid; clear, irregular boundary.

B23tg—51 to 59 inches, mottled gray (10YR 5/1), yellowish-brown (10YR 5/8), dark-red (10R 3/6), and yellowish-red (5YR 4/6) clay; weak, coarse, prismatic structure parting to moderate, medium, subangular and angular blocky structure; friable; reddish parts are firm, brittle and compact; thick clay films on vertical ped faces; about 5 percent plinthite nodules; many tongues of gray fine sandy loam within and between prisms; very strongly acid; clear, irregular boundary.

B24tg—59 to 78 inches, mottled gray (10YR 6/1), yellowish-brown (10YR 5/8), light olive-brown (2.5Y 5/4), and dark-red (10R 3/6) clay loam; moderate, medium, subangular and angular blocky structure; friable; dark red part is firm, brittle and compact; a few pockets and tongues of dark-gray silty clay loam; less than 5 percent plinthite nodules; very strongly acid.

[1] Italic numbers in parentheses refer to Literature Cited, p. 78.

TABLE 1.—*Approximate acreage and proportionate extent of the soils*

Soils	Area	Extent
	Acres	*Percent*
Atmore silt loam	18,010	4.8
Coastal beach	1,524	.4
Escambia silt loam	723	.2
Eustis loamy sand, 0 to 5 percent slopes	18,700	5.1
Eustis and Poarch soils, 8 to 17 percent slopes	6,862	1.9
Handsboro association	11,820	3.2
Harleston fine sandy loam, 0 to 2 percent slopes	10,648	2.8
Harleston fine sandy loam, 2 to 5 percent slopes	15,497	4.2
Hyde silt loam	452	.1
Lakeland fine sand	1,898	.5
Latonia loamy sand	8,920	2.4
McLaurin fine sandy loam, 2 to 5 percent slopes	13,730	3.7
McLaurin fine sandy loam, 5 to 8 percent slopes	732	.2
Nahunta silt loam	3,956	1.1
Nugent and Jena soils	17,100	4.6
Ocilla loamy sand	5,950	1.6
Plummer loamy sand	16,550	4.4
Poarch fine sandy loam, 0 to 2 percent slopes	1,683	.5
Poarch fine sandy loam, 2 to 5 percent slopes	46,405	12.4
Poarch fine sandy loam, 5 to 12 percent slopes	19,762	5.3
Ponzer and Smithton soils	31,720	8.4
Ruston fine sandy loam, 0 to 2 percent slopes	372	.1
Ruston fine sandy loam, 2 to 5 percent slopes	14,490	3.9
Ruston fine sandy loam, 5 to 8 percent slopes	7,870	2.0
Ruston fine sandy loam, 8 to 12 percent slopes	8,040	2.1
Saucier fine sandy loam, 2 to 5 percent slopes	15,166	4.0
Saucier fine sandy loam, 5 to 8 percent slopes	1,358	.3
Saucier, Smithton, and Susquehanna soils, rolling	27,199	7.2
Saucier-Susquehanna complex, 2 to 5 percent slopes	15,050	4.0
Smithdale fine sandy loam, 12 to 17 percent slopes	2,326	.6
Smithton fine sandy loam	25,800	6.9
St. Lucie sand	1,150	.3
St. Lucie sand, hummocky	847	.2
Sulfaquepts	2,218	.6
Total	374,528	100.0

Thickness of the solum is 60 to more than 80 inches. The A1 horizon is dark gray or dark grayish brown and has few to many mottles in shades of brown or gray. The A2 horizon and the upper part of the B2tg horizon are dark gray, light gray, light brownish gray, or gray and have few to many mottles in shades of brown. The upper part of the B2tg horizon is silt loam or loam and is 8 to 18 percent clay. The lower part of the B2tg horizon is typically mottled with shades of gray, brown, and red. The lower part of the B2tg horizon is loam, clay loam, silt loam, silty clay loam, or clay. It is 5 to 20 percent plinthite between depths of 35 to 60 inches. Reaction of the soil ranges from strongly acid to extremely acid.

Atmore soils are associated with Escambia, Ocilla, Plummer, and Smithton soils. They are more gray and less brown in the upper part of the subsoil than Escambia soils. In contrast with Ocilla and Plummer soils, they are more silty. They lack the 20-inch or thicker loamy sand A horizon that is typical of those soils. They differ from Smithton soils in having more than 5 percent plinthite in the Bt horizon above the 60-inch depth.

Atmore silt loam (At).—This is a poorly drained soil on broad flats and in drainageways. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Escambia, Harleston, Hyde, Ocilla, Plummer, and Smithton soils.

This Atmore soil is strongly acid to extremely acid. Permeability is moderate in the upper part and slow in the lower part. The available water capacity is medium to high. The water table is at the surface during wet periods. Runoff is slow.

More than half the acreage is pine woodland. The rest is idle (fig. 9) or is in pasture or urban areas. This soil is suited to bermudagrass, bahiagrass, and fescue. Excessive wetness is a hazard. Surface drainage is needed in areas used as pasture. Capability unit IVw-1; woodland group 2w9.

Coastal Beach

Coastal beach (Cb) is a land type that consists of clean white sand and a few shells.

Coastal beach occurs as a long band between U.S. Highway 90 and the Mississippi Sound and around Deer, Ship, and Cat Islands. These areas are partly covered by tidewater every day and are completely submerged during periods of high tides. Included in mapping are the adjacent areas above daily tide that are kept clean of trash and vegetation.

This land type supports no vegetation. It is suited to recreation. Capability unit VIIIs-1; no woodland suitability rating given.

Escambia Series

The Escambia series consists of somewhat poorly drained soils on uplands. These soils formed in loamy material.

In a representative profile the surface layer is very dark gray silt loam about 4 inches thick. The next layer, about 12 inches thick, is light brownish-gray very fine sandy loam mottled with shades of brown. The subsoil, in sequence from the top, is 9 inches of light yellowish-brown very fine sandy loam mottled with shades of gray and red; 34 inches of loam that is mottled in shades of brown, gray, and red and is as much as 15 percent plinthite nodules; and 28 inches of clay loam and plinthite nodules mottled with shades of brown, gray, red, and yellow.

Representative profile of Escambia silt loam, 1 mile north of State Highway 67 along State Highway 15, and 50 yards northwest, NE¼NW¼ sec. 32, T. 6 S., R. 9 W.

A1—0 to 4 inches, very dark gray (10YR 3/1) silt loam; common, fine, distinct, dark grayish-brown mottles; weak, medium, granular structure; very friable; many fine roots; few pockets of uncoated sand grains; few medium concretions; very strongly acid; clear, smooth boundary.

A2—4 to 16 inches, light brownish-gray (2.5Y 6/2) very fine sandy loam; common, coarse, distinct, light yellowish-brown (2.5Y 6/4) mottles and few, fine, distinct, yellowish-brown mottles; weak, medium, subangular blocky structure; very friable; many fine roots; many fine pores; few, fine and medium, brown concretions; very strongly acid; gradual, irregular boundary.

B21t—16 to 25 inches, light yellowish-brown (2.5Y 6/4) very fine sandy loam; common, coarse, distinct, light brownish-gray mottles and common, fine, prominent, red mottles; weak, medium, subangular blocky structure; friable; common fine roots; coating and bridging of sand grains with clay and oxides; common medium pockets of uncoated sand grains; few fine medium plinthite nodules; very strongly acid; gradual, irregular boundary.

B22t—25 to 35 inches, mottled light yellowish-brown (2.5Y 6/4), gray (10YR 6/1), yellowish-brown (10YR 5/6), and

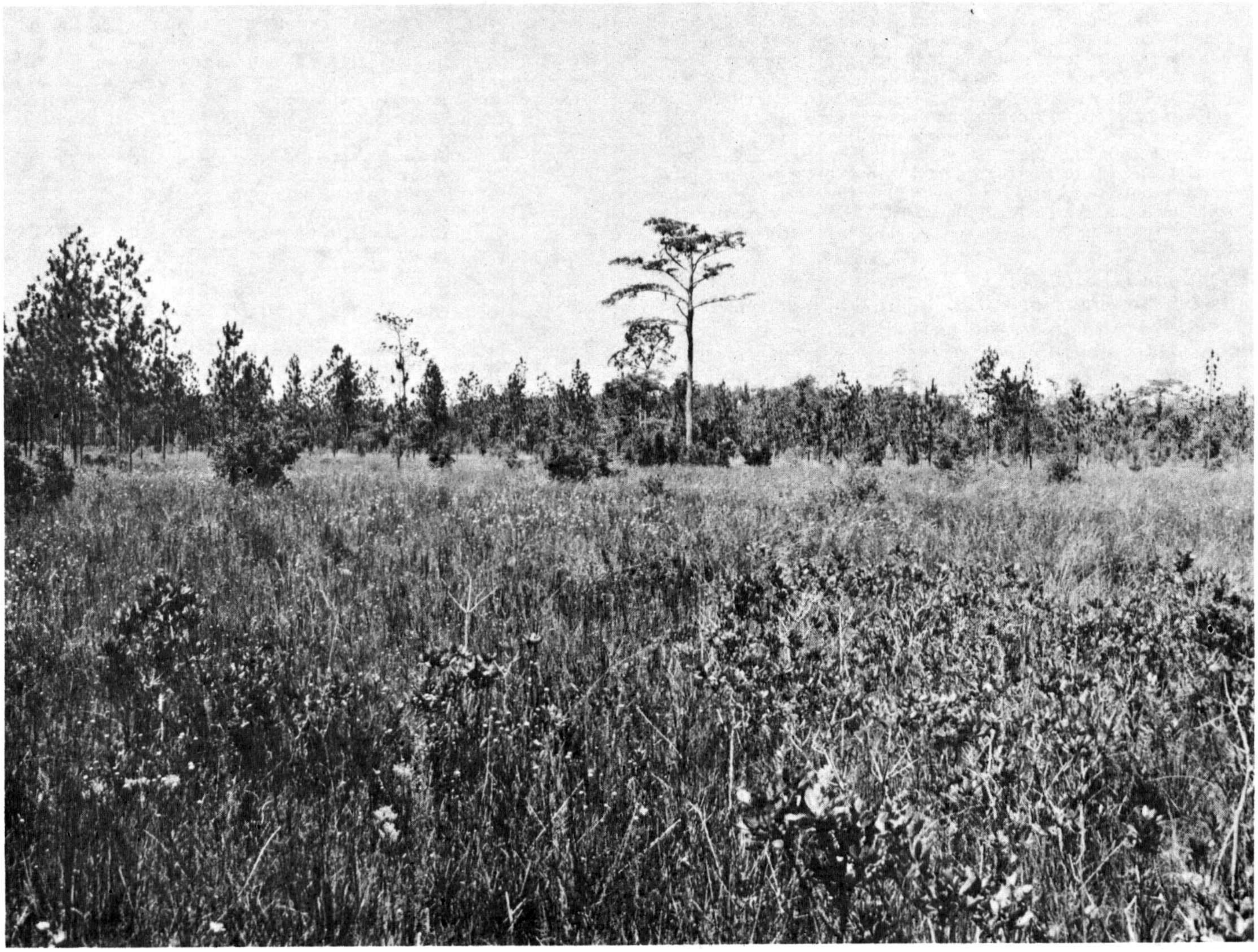

***Figure 9.*—Native vegetation on Atmore silt loam. Wetland vegetation in foreground and longleaf pine and baldcypress in background.**

dark-red (10R 3/6) loam; weak, fine and medium, subangular blocky structure; friable; common fine roots; bridging and coating of sand grains with clay and oxides; some pores are coated with clay films; common fine pockets of uncoated sand grains; few medium plinthite nodules; very strongly acid; gradual, wavy boundary.

B23t—35 to 47 inches, mottled light yellowish-brown (2.5Y 6/4), gray (10YR 6/1), dark-red (10R 3/6), and strong-brown (7.5YR 5/6) loam; moderate, medium, subangular blocky and angular blocky structure; firm; red and brown part is brittle and compact and less than 25 percent, by volume; thin patchy clay films on ped faces; common pockets and seams of uncoated sand grains along vertical cracks; about 15 percent plinthite nodules; very strongly acid; gradual, wavy boundary.

B24t—47 to 59 inches, mottled gray (10YR 6/1), strong-brown (7.5YR 5/8), dark-red (10R 3/6), and light yellowish-brown (2.5Y 6/4) loam; weak, medium, subangular and angular blocky structure; firm, slightly brittle and compact; thin patchy clay films on ped faces; coarse, gray pockets of loam between vertical cracks; few medium plinthite nodules; very strongly acid; gradual, wavy boundary.

B25t—59 to 73 inches, mottled brownish-yellow (10YR 6/8), gray (10YR 6/1), dark-red (10R 3/6), and light yellowish-brown (2.5Y 6/4) clay loam; weak, coarse, subangular and angular blocky structure parting to weak, fine, subangular and angular blocky structure; firm, slightly brittle, slightly sticky and plastic; thick patchy clay films on ped faces; coarse, gray pockets and seams along vertical cracks, gray material is more clayey than in upper horizons; few medium plinthite nodules; very strongly acid; gradual, wavy boundary.

B3t—73 to 87 inches, mottled strong-brown (7.5YR 5/6), dark-red (10R 3/6), gray (N 6/0), and brownish-yellow (10YR 6/6) clay loam; weak, medium, subangular and angular blocky structure; firm, slightly sticky and plastic; thin patchy clay films on ped faces; pockets of coarse gray clay loam along vertical cracks; few medium plinthite nodules; very strongly acid.

The depth to the horizon that has more than 5 percent soft plinthite nodules ranges from 20 to 40 inches. The A1 horizon is very dark gray, dark gray or dark grayish brown. The A2 horizon is dark grayish brown, grayish brown, or light brownish gray. The upper part of the B2t horizon is dark yellowish brown, yellowish brown, light yellowish brown or light olive brown. Few to common gray and red mottles are in the upper

part of the B2t horizon. Some profiles are mottled in shades of brown, yellow, or gray. The upper part of the B2t horizon is silt loam, loam, or very fine sandy loam, and the clay content ranges from 12 to 18 percent. The lower part of the B2t horizon is mottled with shades of brown, gray, yellow, and red. This part of the B2t horizon is clay loam, loam, or sandy clay loam and ranges from 5 to 15 percent plinthite nodules. Reaction of the soil is strongly acid or very strongly acid.

Escambia soils are associated with Atmore, Harleston, and Smithton soils. They are browner and less gray in the upper part of the Bt horizon than Atmore soils. They contain 5 percent or more of plinthite in the Bt horizon, which Harleston soils do not have. They are browner in the upper part of the Bt horizon than Smithton soils and also contain more plinthite.

Escambia silt loam (Es).—This is a somewhat poorly drained soil on low ridges. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Atmore, Harleston, Poarch, Saucier, and Smithton soils, a few areas of a soil that is less than 5 percent plinthite in any horizon, and a few small areas where the surface layer is loam, very fine sandy loam, or sandy loam.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is medium. Runoff is slow.

Most of the acreage is pine woodland. The rest is used as urban areas or pasture. Field crops are not commonly grown. Pasture plants, ornamental shrubs, lawn grasses, and pine trees are suited. Water is a hazard during wet periods, but can be controlled by a surface drainage system. Capability unit IIw–2; woodland group 2w8.

Eustis Series

The Eustis series consists of somewhat excessively drained soils that formed in sandy material on uplands. Slopes are 0 to 17 percent.

In a representative profile the surface layer is loamy sand about 10 inches thick. It is dark grayish brown in the upper part and dark yellowish brown in the lower part. The next layer, about 7 inches thick, is yellowish-brown loamy sand mottled with pale brown. The upper part of the subsoil is strong-brown loamy sand mottled in shades of yellow and red. The lower part of the subsoil, between depths of 59 and 68 inches, is yellowish-red loamy sand mottled in shades of red and yellow. The underlying material, extending to a depth of 83 inches, is loose loamy sand mottled in shades of brown and white.

Representative profile of Eustis loamy sand, 0 to 5 percent slopes, 1½ miles north of U.S. Highway 90 along Menge Avenue, then a half mile west along Montebella Road, and 500 feet north of roadway, SE¼NE¼ sec. 18, T. 8 S., R. 12 W.

Ap1—0 to 6 inches, dark grayish-brown (10YR 4/2) loamy sand; few medium, distinct mottles of yellowish brown (10YR 5/6); weak, fine, granular structure; very friable; few fine roots; common coarse pockets of sand; slightly acid; abrupt, smooth boundary.

Ap2—6 to 10 inches, dark yellowish-brown (10YR 4/4) loamy sand; weak, fine, granular structure; very friable; few fine roots; few thin lenses of dark grayish-brown (10YR 4/2) sandy material; few, fine, faint worm casts; medium acid; clear, smooth boundary.

A2—10 to 17 inches, yellowish-brown (10YR 5/4) loamy sand; single grained; loose; few fine roots; many, medium faint pockets of pale-brown (10YR 6/3) uncoated sand grains; medium acid; clear, smooth boundary.

B21t—17 to 33 inches, strong-brown (7.5YR 5/6) loamy sand; common, medium, faint mottles of yellowish brown (10YR 5/4); weak, fine and medium, subangular blocky structure; very friable; few fine roots; clay coatings and oxides on sand grains; strongly acid; gradual, smooth boundary.

B22t—33 to 44 inches, strong-brown (7.5YR 5/8) loamy sand; many, coarse, faint mottles of brownish yellow (10YR 6/6) and very pale brown (10YR 7/3); weak, fine and medium, subangular blocky structure; very friable; few fine roots; clay and oxides on sand grains; strongly acid; gradual, irregular boundary.

B23t—44 to 59 inches, strong-brown (7.5YR 5/8) loamy sand; many, coarse, distinct mottles of yellowish red (5YR 5/8); single grained; loose; few fine roots; sand grains coated with clay and oxides; common fine pockets of uncoated sand grains; a coarse vertical pocket of light-gray (10YR 7/2) uncoated sand more than a foot wide and has common, medium and coarse, distinct mottles of brownish yellow (10YR 6/6); strongly acid; gradual, irregular boundary.

B3t—59 to 68 inches, yellowish-red (5YR 4/8) loamy sand; common, medium, distinct mottles of brownish yellow (10YR 6/6); single grained; loose; sand grains coated with clay; common fine pockets of uncoated sand grains; few medium rounded pebbles; a coarse vertical pocket of light-gray (10YR 7/2) uncoated sand more than a foot wide has common, medium and coarse, distinct mottles of brownish yellow (10YR 6/6); strongly acid.

C—68 to 83 inches, mottled very pale brown (10YR 7/4), yellowish-brown (10YR 5/8), and white (10YR 8/1) loamy sand or sand; single grained; loose; few fine and medium quartz pebbles; strongly acid.

The Ap horizon is very dark grayish brown, very dark gray, dark grayish brown, or dark yellowish brown. The A2 horizon is brown, dark yellowish brown, or yellowish brown. The B2t horizon is reddish brown, red, strong brown, yellowish red, or yellowish brown. It is loamy sand or loamy fine sand that contains at least 3 percent more clay than the A2 horizon. The C horizon is reddish-yellow, yellowish-brown, yellowish-red, gray, light-gray, or white sand. Reaction of the soil is strongly acid or very strongly acid, except for the surface layer in limed areas.

Eustis soils are associated with Lakeland, Latonia, and McLaurin soils. They are similar to Lakeland soils but have a loamy sand Bt horizon. They are sandier throughout than the McLaurin soils. They have a sandier Bt horizon than the Latonia soils.

Eustis loamy sand, 0 to 5 percent slopes (EtB).—This is a somewhat excessively drained soil on ridgetops. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Lakeland, Latonia, and Poarch soils and small areas of soils that have gray mottles within a depth of 30 inches.

This soil is strongly acid or very strongly acid. Permeability is moderately rapid, and available water capacity is low. There is little or no runoff.

More than half of the acreage is pine woodland. The rest is used for urban purposes or pasture or is idle. This soil is suited to pasture plants, lawn grasses, ornamental shrubs, and pine trees. Prolonged dry periods are a hazard to plants because the available water capacity is low. Soil blowing is a hazard where the soil is left bare and unprotected in dry periods, but this hazard can be controlled by planting perennial vegetation, such as grasses and legumes or pine trees. Capability unit IIIs–1; woodland group 3s2.

Eustis and Poarch soils, 8 to 17 percent slopes (EuE).—This mapping unit is on rough, hilly uplands. It is about 36 percent Eustis soils, 28 percent Poarch soils, and 36 percent mainly Lakeland, Latonia, Plummer, Ruston, and Smithton soils. The landscape, chiefly forested, is one of narrow ridgetops and sloping to moderately steep side

slopes broken by numerous short drainageways. Areas are rather small. They range from about 10 to 70 acres in size.

Eustis and Poarch soils occur together without regularity of pattern. Many areas contain both soils and some or all of the less extensive soils. Some areas contain either of the two major soils along with less extensive soils.

The Eustis soil is on the middle and lower parts of slopes. It is somewhat excessively drained and strongly acid to very strongly acid. Permeability is moderately rapid, and available water capacity is low. The surface layer is dark grayish-brown loamy sand about 5 inches thick; the next layer is 11 inches of dark yellowish-brown loamy sand; next is 17 inches of yellowish-brown loamy sand; below this is 23 inches of yellowish-red loamy sand that grades to a structureless reddish-yellow loamy sand below a depth of about 72 inches.

The Poarch soil is generally on the upper parts of slopes and ridges. It is well drained and strongly acid or very strongly acid. Permeability is moderate in the upper part and moderately slow in the lower part. Available water capacity is medium. The surface layer is very dark grayish-brown fine sandy loam about 5 inches thick, the next 29 inches is yellowish-brown fine sandy loam; next is 20 inches of fine sandy loam mottled in shades of brown, gray, and red, which is underlain by a dense, compact and brittle fine sandy loam mottled in shades of brown, gray, and red.

These soils are used chiefly for growing trees. Because they are steep and are broken into smaller areas by numerous short drainageways, they are not well suited to row crops. They are suited to trees. Areas flat enough to be mowed by mechanized equipment are suited to pasture plants. Runoff and erosion are hazards in bare and unprotected areas.

These soils are well suited to southern, longleaf, slash, loblolly, and shortleaf pines. Drainageways and the narrow flats along them support red oak, black gum, tupelos, sweetbay, magnolia, yellow-poplar, and red maple. Understory plants are gallberry, waxmyrtle, and titi. Site preparation on this unit generally lasts for two years. Understory invasion by woody plants varies slightly from area to area according to the soils that make up each area. Blackjack oak, red oak, post oak, and gallberry are the main invaders on Poarch soils on ridges. Invaders on Eustis soils are bluejack oak, turkey oak, dogwood, post oak, and red oak. Few of these ever attain a size and quality that is merchantable. Eustis soils in capability unit VIIs–1, woodland group 3s2; Poarch soils in capability unit IVe–1, woodland group 2o1.

Handsboro Series

The Handsboro series consists of very poorly drained soils that formed in highly decomposed herbaceous plant remains and thin mineral layers. These soils adjoin salt water or brackish water at elevations of less than 2 feet and are periodically flooded by high tides.

In a representative profile the surface layer is very dark gray mucky silt loam about 2 inches thick. The next layer is very dark grayish-brown, well-decomposed organic material about 26 inches thick. The underlying material, to a depth of about 60 inches, is very dark gray organic material that contains 2- to 4-inch strata of dark grayish-brown loam.

Representative profile of Handsboro mucky silt loam from an area of Handsboro association, 0.4 mile north of the south end of Popps Ferry Bridge along Popps Ferry Road, and 250 feet east of roadway, NE¼SW¼ sec. 22, T. 7 S., R. 10 W.

A1—0 to 2 inches, very dark gray (10YR 3/1) mucky silt loam; common, coarse, faint, black (10YR 2/1) mottles; structureless; slightly sticky; many fine roots; conductivity 13 millimhos per centimeter; moderately alkaline in water; abrupt, smooth boundary.

Oa1—2 to 10 inches, sapric material, very dark grayish brown (10YR 3/2) broken face, pressed, or rubbed; about 65 percent fiber, about 12 percent fiber rubbed; structureless; nonsticky; many fine roots; about 35 percent mineral; conductivity 17 millimhos per centimeter; moderately alkaline in water; gradual, smooth boundary.

Oa2—10 to 28 inches, sapric material, very dark grayish brown (10YR 3/2) broken face, pressed, or rubbed; about 30 percent fiber, 12 percent fiber rubbed; structureless; nonsticky; many fine roots; about 30 percent mineral; conductivity 34 millimhos per centimeter; moderately alkaline in water; gradual, smooth boundary.

Oa3—28 to 37 inches, sapric material, very dark gray (10YR 3/1) broken face, very dark grayish brown (10YR 3/2) pressed or rubbed; about 25 percent fiber, 8 percent fiber rubbed; structureless; nonsticky; common fine roots; about 35 percent mineral; mildly alkaline in water; clear, smooth boundary.

IIC1—37 to 39 inches, dark grayish-brown (10YR 4/2) loam; structureless; slightly sticky; common fine roots; moderately alkaline in water; clear, smooth boundary.

Oa4—39 to 43 inches, sapric material, very dark gray (10YR 3/1) broken face, very dark grayish brown (10YR 3/2) pressed or rubbed; about 10 percent fiber, 1 percent fiber rubbed; structureless; nonsticky; common fine roots; about 30 percent mineral; mildly alkaline in water; clear, smooth boundary.

IIC2—43 to 45 inches, dark grayish-brown (10YR 4/2) loam; structureless; slightly sticky; common fine roots; moderately alkaline in water; clear, smooth boundary.

Oa5—45 to 50 inches, sapric material, very dark gray (10YR 3/1) broken face, very dark grayish brown (10YR 3/2) pressed or rubbed; about 8 percent fiber, 1 percent fiber rubbed; structureless; nonsticky; common fine roots; about 35 percent mineral; mildly alkaline in water; clear, smooth boundary.

IIC3—50 to 54 inches, dark grayish-brown (10YR 4/2) loam; structureless; slightly sticky; common fine roots; moderately alkaline in water; clear, smooth boundary.

Oa6—54 to 60 inches, sapric material, very dark gray (10YR 3/1) broken face, very dark grayish brown (10YR 3/2) pressed or rubbed; about 6 percent fiber, 1 percent fiber rubbed; structureless; nonsticky; common fine roots; about 40 percent mineral; mildly alkaline in water.

The organic horizons range from 30 to 55 percent in mineral content. Between depths of 12 and 51 inches, they are black or very dark gray and have a rubbed fiber content of 1 to 12 percent. The mineral layers in the upper 51 inches range from 2 to 4 inches in thickness and from silt loam and sandy loam to silt in texture. Reaction ranges from neutral to moderately alkaline in undrained soil and is very strongly acid or extremely acid in dry soil. Conductivity of the saturation extract in layers at depths below 6 inches ranges from about 16 to 35 millimhos per centimeter. Sulfur content ranges from 0.75 to about 2.0 percent in the subhorizons at depths ranging from 12 to 40 inches.

Hansboro soils are associated with Hyde, Ponzer, and St. Lucie soils. They formed in dark, well-decomposed, fibrous, organic materials adjoining salt or brackish water. Hyde soils, in contrast, formed in loamy materials, and St. Lucie soils in sandy materials. Handsboro soils lack the thick mineral layers above a depth of 51 inches that are in the Ponzer soils, and they contain sulfur within a depth of 12 to 40 inches.

Handsboro association (Ha).—This is dominantly a very poorly drained, well-decomposed, organic soil on broad, wet, grassy flats along the coast, adjoining salt-

water or brackish water at elevations of less than 2 feet. Slopes are 0 to 2 percent. Also in this association are small, narrow areas of dominantly stratified mineral soils along rivers; small areas of organic soils that have water on the surface; small areas of organic soils that lack strata of mineral material; and small areas of organic soils that are less than 51 inches deep over mineral material.

This soil association is neutral to moderately alkaline. The available water capacity is very high. Permeability of the organic soil is moderate.

This soil association becomes extremely acid upon drying and has as much as 2 percent sulfidic material in the profile. It becomes almost sterile and supports no vegetation in the first few years after it dries. This sterility severely limits use. Native vegetation is extremely sparse and consists mostly of needlerush, cordgrass, and three-square bulrush. Most of the acreage is used as a habitat for waterfowl, fish, and marsh animals. Areas of this soil association are an important part of the salt-water estuarine system, but each year more of the acreage is used for industrial development, as a site for spoil left in constructing navigable waterways, and for residential development.

This soil association is suited to wildlife habitat. The high water table, flooding, low presumptive bearing value, and high corrosion potential severely limit its use for residential and commercial developments. Capability unit VIIIw-1; not assigned to a woodland group.

Harleston Series

The Harleston series consists of moderately well drained soils that formed in loamy materials on uplands. Slopes are 0 to 5 percent.

In a representative profile the surface layer is very dark gray fine sandy loam about 2 inches thick that is mottled with dark yellowish brown. The next layer, about 4 inches thick, is dark grayish-brown fine sandy loam mottled with yellowish brown. The subsoil, to a depth of 43 inches, is mainly brownish-yellow fine sandy loam mottled in the lower part with shades of brown and gray. The next 15 inches of the subsoil is mottled yellowish-brown, gray, and red sandy clay loam. Below this, and to a depth of 98 inches, the lower part of the subsoil and the substratum are fine sandy loam mottled in shades of gray, brown, and red.

Representative profile of Harleston fine sandy loam, 0 to 2 percent slopes, 1⅞ miles north of State Highway 67 along State Highway 15, then southeast three-fourths mile along a blacktop road and 75 yards east of roadway, SW¼ SW¼ sec. 28, T. 6 S., R. 9 W.

A1—0 to 2 inches, very dark gray (10YR 3/1) fine sandy loam; few, fine, faint, dark yellowish-brown (10YR 3/4) mottles; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, smooth boundary.

A2—2 to 6 inches, dark grayish-brown (10YR 4/2) fine sandy loam; few, fine, yellowish-brown (10YR 5/6) mottles; weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, smooth boundary.

B1—6 to 11 inches, light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; thin clay films on some ped faces; strongly acid; clear, smooth boundary.

B21t—11 to 17 inches, brownish-yellow (10YR 6/6) fine sandy loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; thin clay films on ped faces; strongly acid; clear, smooth boundary.

B22t—17 to 22 inches, brownish-yellow (10YR 6/6) fine sandy loam; common, medium, faint, yellowish-brown (10YR 5/8) mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; strongly acid; clear, smooth boundary.

B23t—22 to 31 inches, brownish-yellow (10YR 6/6) fine sandy loam; common, fine, faint, strong-brown (7.5YR 5/8) mottles and common, fine, distinct, light-gray (10YR 7/2) mottles; weak, fine and medium, subangular blocky structure; friable; pale-brown (10YR 6/3) pockets of uncoated sand grains; clay bridging and coating of sand grains; strongly acid; clear, wavy boundary.

B24t—31 to 43 inches, yellowish-brown (10YR 5/6) fine sandy loam; common, coarse, distinct, gray (10YR 6/1) mottles and common, medium, faint, light yellowish-brown (10YR 6/4) mottles; weak, fine and medium, subangular blocky structure; friable; thin patchy clay films on ped faces; gray sandy loam pockets are 8 to 9 percent of the volume; few, medium, brown concretions; strongly acid; clear, wavy boundary.

B25t—43 to 53 inches, mottled yellowish-brown (10YR 5/6), gray (10YR 6/1), light yellowish-brown (2.5Y 6/4), and red (2.5YR 4/8) sandy clay loam; moderate, fine and medium, subangular blocky structure; friable; thin patchy clay films on ped faces; strongly acid; clear, wavy boundary.

B26t—53 to 58 inches, mottled gray (10YR 6/1), red (2.5YR 4/8), and yellowish-brown (10YR 5/8) sandy clay loam; weak, fine and medium, subangular blocky structure; friable; thin patchy clay films on ped faces; strongly acid; clear, wavy boundary.

B3t—58 to 75 inches, mottled light-gray (10YR 7/2), light yellowish-brown (2.5Y 6/4), and yellowish-red (5YR 5/8) fine sandy loam; weak, medium, subangular blocky structure; friable; bridging and coating of sand grains with clay and oxides; strongly acid; clear, wavy boundary.

C—75 to 98 inches, mottled light-gray (10YR 7/2), light yellowish-brown (2.5Y 6/4), yellowish-brown (10YR 5/8), and red (10R 4/8) fine sandy loam; massive; friable; medium acid; clear, wavy boundary.

The solum ranges from 60 to more than 80 inches in thickness. It is strongly acid or very strongly acid. The A1 horizon is very dark grayish brown, very dark gray, dark gray, dark brown, or brown. The A2 horizon is dark grayish brown, grayish brown, pale brown, yellowish brown, or light olive brown. The upper 20 inches of the Bt horizon is fine sandy loam or loam and is yellowish brown, light olive brown, brownish yellow, or strong brown. It is 8 to 18 percent clay. Below a depth of 31 inches, the Bt horizon ranges from fine sandy loam to clay loam or sandy clay loam that has colors similar to those of the upper part or is mottled with shades of brown, red, and gray. Content of plinthite nodules ranges from 0 to 4 percent.

Harleston soils are associated with Escambia, Latonia, and Poarch soils. They are browner in the upper part of the B horizon than the Escambia soils. They have gray mottles above a depth of 30 inches, which the Latonia and Poarch soils lack. Harleston soils are finer textured in the lower part of the B horizon than the Latonia soils.

Harleston fine sandy loam, 0 to 2 percent slopes (HlA).—This is a moderately well drained soil on ridgetops. This soil has the profile described as representative for the series.

Included with this soil in mapping are small areas of Escambia, Latonia, and Poarch soils and small areas of soils that have a loamy sand surface layer.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is slow.

More than half the acreage is used for pine trees, and the rest is used for pasture or urban areas or is idle. This soil is well suited to corn, soybeans, pasture plants, lawn

grasses, ornamental shrubs, and pine trees. Runoff from nearby soils tends to collect on this soil during and immediately after periods of prolonged rainfall. Surface drainage is needed if the soil is used intensively. Capability unit IIw-1; woodland group 2w8.

Harleston fine sandy loam, 2 to 5 percent slopes (HlB).—This moderately well drained soil is on ridgetops, around heads of drainageways, and on side slopes. It has a very dark gray fine sandy loam surface layer about 3 inches thick. The next 3 inches is very dark grayish-brown fine sandy loam. The upper part of the subsoil is light olive-brown fine sandy loam. The lower part of the subsoil is loam mottled with shades of brown, gray, and red.

Included with this soil in mapping are small areas of Escambia, Latonia, and Poarch soils and small areas of soils that have a loamy sand surface layer.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is slow to medium.

More than half the acreage is used for pine trees, and the rest is used for pasture or urban areas or is idle. This soil is suited to corn, soybeans, pasture grasses, lawn grasses, ornamental shrubs, and pine trees. Erosion is a slight hazard where the soil is bare and unprotected, but can be controlled by planting perennial grasses and legumes or pine trees. Capability unit IIe-1; woodland group 2w8.

Hyde Series

The Hyde series consists of very poorly drained soils that have a thick, dark surface layer. These soils formed in loamy materials.

In a representative profile the surface layer, about 16 inches thick, is very dark gray silt loam that has grayish mottles. The upper part of the subsoil, to a depth of 35 inches, is dark gray or gray silty clay loam that has brownish mottles. The lower part of the subsoil, to a depth of 60 inches, is grayish and brownish silty clay loam.

Representative profile of Hyde silt loam near Long Beach, three-eighths mile north of 28th Street and Klondike Road intersection, along a private road and 150 feet east of roadway, NW¼SE¼ sec. 36, T. 7 S., R. 12 W.

A11—0 to 4 inches, very dark gray (10YR 3/1) silt loam; weak, fine, granular structure; friable; common fine roots; few medium pockets of light brownish-gray (10YR 6/2) silt and sand; very strongly acid; clear, smooth boundary.

A12—4 to 16 inches, very dark gray (10YR 3/1) silt loam; weak, fine, granular structure; friable; few fine roots; few medium pockets of light brownish-gray (10YR 6/2) silt and sand; very strongly acid; clear, smooth boundary.

B21tg—16 to 23 inches, dark-gray (10YR 4/1) silty clay loam; few, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine and medium, subangular blocky and angular blocky structure; friable, slightly plastic and slightly sticky; few fine roots; thin patchy clay films on peds; very strongly acid; clear, wavy boundary.

B22tg—23 to 35 inches, gray (10YR 5/1) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles, common, coarse, faint, dark-gray (10YR 4/1) mottles, and few, medium, distinct, dark-brown (7.5 YR 4/4) mottles; weak, fine and medium, subangular blocky structure; friable, slightly plastic and slightly sticky; few fine roots; thin patchy clay films on peds; very strongly acid; clear, wavy boundary.

B23tg—35 to 49 inches, mottled gray (10YR 6/1), yellowish-brown (10YR 5/8), dark-gray (10YR 4/1), and strong-brown (7.5YR 5/6) silty clay loam; weak, fine and medium, subangular blocky structure; friable, slightly plastic and slightly sticky; few fine roots; clay films on peds; a coarse, vertical, cylindrical area of mottled dark-gray (10YR 4/1) and gray (10YR 6/1) silt loam appears to be a filled root hole; very strongly acid; clear, wavy boundary.

B24tg—49 to 60 inches, mottled gray (10YR 6/1), dark-gray (10YR 4/1), and strong-brown (7.5YR 5/6) silty clay loam; weak, fine and medium, subangular blocky structure; friable, slightly plastic and slightly sticky; few fine roots; patchy thin clay films on peds; a coarse, vertical, cylindrical area of mottled dark-gray (10YR 4/1) and gray (10YR 6/1) silt loam appears to be a filled root hole; very strongly acid.

The A horizon ranges from 10 to 18 inches in thickness. The A horizon is high in content of organic matter and is mostly black or very dark gray. The upper part of the B horizon is dominantly dark gray or gray, and the lower part is dark gray or gray or is mottled with shades of gray or brown. Texture of the B horizon is silty clay loam or silt loam. It is 18 to 35 percent clay. Reaction of the soil is strongly acid or very strongly acid.

In this county the soils classified in the Hyde series are outside the range defined for the series in that they have siliceous mineralogy. This difference does not affect their use and management.

Hyde soils are associated with Handsboro, Ponzer, Smithton, and St. Lucie soils. They are mineral soils and lack the organic layer that is typical of the Handsboro and Ponzer soils. In contrast with the excessively drained St. Lucie soils, they are very poorly drained. They also have a finer texture.

Hyde silt loam (Hy).—This is a very poorly drained soil in depressions and drainageways. Slopes are 0 to 2 percent. Included in mapping are small areas of Atmore, Ponzer, and Smithton soils.

This soil is strongly acid or very strongly acid. Permeability is moderately slow, and available water capacity is high. Runoff is slow or very slow.

Most of the acreage is in water-tolerant trees. The rest is used for urban purposes or native pasture. Field crops are not commonly grown. This soil is suited to pasture plants, ornamental shrubs, and lawn grasses. Excessive wetness is a hazard. The water table is at the surface many days following rainy periods. For intensive use, a surface drainage system is needed. Capability unit IVw-1; woodland group 1w9.

Jena Series

The Jena series consists of well-drained soils that formed in loamy material on flood plains of larger streams.

In a representative profile the surface layer is dark-brown fine sandy loam about 6 inches thick. The subsoil is fine sandy loam 29 inches thick. The upper part is dark brown, and the lower part is yellowish brown. The underlying material is pale-brown loamy sand to a depth of 43 inches and light yellowish-brown fine sandy loam to a depth of 60 inches.

Representative profile of Jena fine sandy loam from an area of Nugent and Jena soils 5.4 miles north of d'Iberville (part way via Jackson County) along the d'Iberville-Vestry Road, then 0.9 mile west along blacktop road, and 0.9 mile west-south-west along Mississippi Power Company power transmission line right-of-way, SW¼NE¼ sec. 21, T. 6 S., R. 9 W.

A1—0 to 6 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; friable; common fine roots; few medium pockets of loamy sand; few fine charcoal fragments; very strongly acid; gradual, smooth boundary.

B21—6 to 15 inches, dark-brown (10YR 4/3) fine sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; common medium pockets of brown (10YR 5/3) fine sandy loam; few fine charcoal fragments; very strongly acid; gradual, smooth boundary.

B22—15 to 35 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, medium, subangular blocky structure; friable; few fine roots; few fine charcoal fragments; strongly acid; gradual, smooth boundary.

C1—35 to 43 inches, pale-brown (10YR 6/3) loamy sand; structureless; very friable; few fine roots; few thin bands of sandy loam; coarse strata or lenses of uncoated sand; strongly acid; gradual, smooth boundary.

C2—43 to 60 inches, light yellowish-brown (10YR 6/4) fine sandy loam; structureless; friable; few fine roots; very strongly acid.

The A horizon is dark-brown, brown, or dark yellowish-brown fine sandy loam or loamy sand. The B horizon is dark-brown, brown, pale-brown, light yellowish-brown or yellowish-brown fine sandy loam, sandy loam, or loam. The layers between depths of 10 and 40 inches are generally fine sandy loam or silt loam and are less than 18 percent clay. The C horizon is loamy sand, fine sandy loam, sandy loam, or silt loam. Reaction of the soil is strongly acid or very strongly acid.

Jena soils are associated with Lakeland, Nugent, and Latonia soils. They are finer textured than Lakeland soils, and they have a weakly developed B horizon that is lacking in Lakeland soils. They lack coating and bridging of sand grains in their B horizon, as is characteristic of Latonia soils. They lack the bedding planes in the upper 20 inches of the profile that are characteristic of Nugent soils.

Lakeland Series

The Lakeland series consists of excessively drained soils on uplands. These soils formed in sandy material.

In a representative profile the surface layer is fine sand about 9 inches thick. The upper part is very dark gray and the lower part is mottled brown, dark yellowish brown, and grayish brown. The underlying material is fine sand to a depth of 60 inches. It is yellowish brown in the upper part, pale brown in he middle part, and mottled yellowish brown and very pale brown in the lower 10 inches. Below this, between depths of 60 and 72 inches, is white sand.

Representative profile of Lakeland fine sand in Biloxi, about a half mile north of U.S. Highway 90, along Beauvoir Avenue, and 75 feet east of roadway, NW¼NE¼ sec. 34, T. 7 S., R. 10 W.

A11—0 to 4 inches, very dark gray (10YR 3/1) fine sand; very weak, fine, granular structure; very friable; common fine and few medium roots; many coarse pockets of brown sand; strongly acid; clear, wavy boundary.

A12—4 to 9 inches, mottled brown (10YR 5/3), dark yellowish-brown (10YR 4/4), and grayish-brown (10YR 5/2) fine sand; weak, fine, granular structure; very friable; few medium, coarse and fine roots; few common fine charcoal fragments; strongly acid; clear, wavy boundary.

C1—9 to 28 inches, yellowish-brown (10YR 5/4) fine sand; single grained; very friable; few fine pockets of uncoated sand grains; few fine roots; strongly acid; diffuse, wavy boundary.

C2—28 to 50 inches, pale-brown (10YR 6/3) fine sand; single grained; very friable; few fine roots; common fine pockets and root holes filled with uncoated sand grains; strongly acid; diffuse, wavy boundary.

C3—50 to 60 inches, mottled yellowish-brown (10YR 5/6) and very pale brown (10YR 7/3) fine sand; single grained; very friable; few fine roots; many fine and medium light-gray (10YR 7/2) pockets of uncoated sand grains; thin bands of strong-brown (7.5YR 5/6) loamy sand; strongly acid; clear, wavy boundary.

C4—60 to 72 inches, white (10YR 8/1) sand; single grained; loose; few fine roots; lower part of horizon contains common, coarse, distinct mottles of pale brown (10YR 6/3) and brownish yellow (10YR 6/6); strongly acid.

The A horizon is very dark gray, dark gray, dark grayish brown, brown, or yellowish brown. The C horizon ranges from sand to fine sand and is 5 to 10 percent silt and some clay between depths of 10 and 40 inches. The upper part of the C horizon is light yellowish brown, yellowish brown, or pale brown. The lower part of the C horizon is dominantly white uncoated sand. Reaction of the soil is strongly acid or very strongly acid.

Lakeland soils are associated with Eustis, Jena, and Poarch soils. They are similar to Eustis soils but lack the loamy sand Bt horizon. They are coarser textured than Jena soils and lack the weakly developed B horizon. They differ from Poarch soils in being more sandy throughout the profile.

Lakeland fine sand (Lr).—This is an excessively drained soil on broad low ridges. Slopes are 0 to 5 percent. Included in mapping are small areas of Eustis, Latonia, and Poarch soils.

This soil is strongly acid or very strongly acid. Permeability is rapid. The available water capacity is low, and as a result prolonged dry periods are hazardous to plants. There is little or no runoff.

More than half of the acreage is pine woodland. The rest is used for urban purposes or pasture or is idle. Pasture plants, lawn grasses, ornamental shrubs, and pine trees are suited. During dry periods soil blowing is a hazard in bare, unprotected areas. Perennial vegetation, such as grasses and legumes or pine trees, can help to control soil blowing. Capability unit IVs–1; woodland group 4s3.

Latonia Series

The Latonia series consists of well-drained soils on uplands. These soils formed in loamy material high in content of sand.

In a representative profile the surface layer is dark grayish-brown loamy sand about 9 inches thick. The subsoil is yellowish-brown sandy loam 18 inches thick. The underlying material is yellowish-brown loamy sand that has brownish or yellowish mottles to a depth of 47 inches. Below this, to a depth of 69 inches, is white sand mottled in shades of brown and red.

Representative profile of Latonia loamy sand in a large idle area near Long Beach, one-eighth mile north of Pineville Road along Daugherty Road, then one-quarter mile northeast along Patton Road, and 100 feet north of pavement, NE¼NE¼ sec. 10, T. 8 S., R. 12 W.

Ap—0 to 9 inches, dark grayish-brown (10YR 4/2) loamy sand; weak, fine, granular structure; very friable, common fine roots; few, fine and medium, black charcoal fragments; some mixing of material of underlying horizon with the lower 2 inches; strongly acid; abrupt, wavy boundary.

B21t—9 to 16 inches, yellowish-brown (10YR 5/6) sandy loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; few fine charcoal fragments; uncoated sand grains along fine vertical holes; strongly acid; clear, wavy boundary.

B22t—16 to 27 inches, yellowish-brown (10YR 5/8) sandy loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; few pockets of uncoated sand

grains; few, medium, strong-brown (7.5YR 5/8) nodules; strongly acid; clear, smooth boundary.

IIC1—27 to 38 inches, mottled yellowish-brown (10YR 5/8) and yellowish-red (10YR 5/6) loamy sand; few, fine, faint mottles of strong brown (7.5YR 5/6); structureless; very friable; few fine roots; many fine pockets of uncoated sand; few fine quartz pebbles; strongly acid; clear, wavy boundary.

IIC2—38 to 47 inches, yellowish-brown (10YR 5/6) loamy sand; many, medium and coarse, faint mottles of brownish yellow (10YR 6/8); structureless; very friable; few fine roots; many fine pockets of uncoated sand; many, medium and coarse, strong-brown (7.5YR 5/6) friable nodules; strongly acid; abrupt, irregular boundary.

IIC3—47 to 69 inches, white (10YR 8/1) sand; common, coarse, distinct mottles of yellowish brown (10YR 5/8) and few, fine and medium, distinct mottles of yellowish red (5YR 4/6); structureless; single grained; loose; few fine roots; strongly acid; abrupt, smooth boundary.

The solum ranges from 22 to 45 inches in thickness. The Ap and A2 horizons are dark gray, dark grayish brown, dark brown, or dark yellowish brown. In undisturbed areas, there is a very dark gray or very dark grayish-brown A1 horizon 2 to 4 inches thick. The Bt horizon is yellowish brown, dark yellowish brown, or light olive brown and ranges from fine sandy loam to sandy loam. The C horizon is yellowish brown, light yellowish brown, very pale brown, or white loamy sand to sand. Few to many, fine to coarse pockets of uncoated sand grains are throughout the soil in some profiles. Reaction of the soil is strongly acid or very strongly acid throughout.

Latonia soils are associated with Eustis, Harleston, and Jena soils. They are less sandy and more yellow in the upper part of the Bt horizon than the Eustis soils. They lack mottles of 2 chroma or less in the upper 30 inches, but such mottles are characteristic of the Harleston soils. They have coating and bridging of sand grains in the B horizon, but Jena soils do not.

Latonia loamy sand (Lt).—This is a well-drained soil on low ridges. Slopes are 0 to 5 percent. Included in mapping are small areas of Eustis, Harleston, and Jena soils.

This soil is strongly acid or very strongly acid. Permeability is moderately rapid, and available water capacity is medium. Runoff is slow.

More than half of the acreage is pine woodland. The rest is in urban areas or is used for pasture. Pasture plants, lawn grasses, ornamental shrubs, and pine trees are suited. In dry periods soil blowing is a hazard if the soil is left bare and unprotected. Planting perennial vegetation, such as grasses and legumes or pine trees, can help to control soil blowing. Capability unit IIe-2; woodland group 2o1.

McLaurin Series

The McLaurin series consists of well-drained soils on uplands. These soils formed in loamy material. Slopes are 2 to 8 percent.

In a representative profile the surface layer is dark grayish-brown fine sandy loam about 4 inches thick. Below this is 13 inches of brown or yellowish-brown fine sandy loam. The subsoil is reddish to a depth of 60 inches. The upper 17 inches of subsoil is yellowish-red fine sandy loam, the next 10 inches is yellowish-red loamy sand, and the lower part is red sandy loam to sandy clay loam.

Representative profile of McLaurin fine sandy loam, 2 to 5 percent slopes, three-quarter mile east of old Success School along blacktop road, north a half mile along gravel road, then 500 feet northeastward along private road, and 50 feet south of roadway, NW¼NW¼ sec. 18, T. 5 S., R. 10 W.

A1—0 to 4 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; some compaction; very strongly acid; clear, smooth boundary.

A2—4 to 9 inches, brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; very friable; few fine roots; very strongly acid; clear, smooth boundary.

A3—9 to 17 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, fine, granular structure; very friable; few fine roots; very strongly acid; clear, wavy boundary.

B2t—17 to 34 inches, yellowish-red (5YR 4/6) fine sandy loam; weak, medium and fine, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; very strongly acid; gradual, wavy boundary.

A'2&B3—34 to 43 inches, yellowish-red (5YR 5/8) loamy sand; weak, fine and medium, subangular blocky structure; very friable; few fine roots; common medium pockets of uncoated sand grains; B3 material is somewhat heavier than A'2 material; very strongly acid; clear, smooth boundary.

B'21t—43 to 49 inches, red (2.5YR 4/8) sandy loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; common fine pockets of uncoated sand grains; very strongly acid; gradual, wavy boundary.

B'22t—49 to 60 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium and fine, angular and subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; thin patchy clay film on ped faces; very strongly acid.

The A1 horzon is very dark grayish brown, dark brown, or dark grayish brown. The A2, A3, and Ap horizons are dark brown, dark grayish brown, brown, or yellowish brown. The B2t horizon is red, reddish brown, or yellowish red. Its texture is sandy loam, loam, or sandy clay loam that ranges from 10 to 18 percent clay. The B3 horizon, where present, is similar in color to the B2 horizon. Its texture ranges from sandy loam to loamy sand. The A'2 part of the A'2&B3 horizon is essentially stripped of clay and has paler colors. Reaction of the soil is strongly acid or very strongly acid throughout.

McLaurin soils are associated with Eustis, Ruston, and Smithdale soils. They are less sandy in the B horizon than Eustis soils. They contain less clay in the upper part of the B horizon than Ruston and Smithdale soils.

McLaurin fine sandy loam, 2 to 5 percent slopes (MlB).—This is a well-drained soil on ridges. It has the profile described as representative of the series.

Included with this soil in mapping are small areas of Eustis, Ruston, and Smithdale soils and a few small areas where the surface layer is loamy sand.

This soil is strongly acid or very strongly acid. Permeability is moderate to moderately rapid, and available water capacity is medium. Runoff is slow to medium. Tilth is easily maintained by proper use of crop residue. A plowpan forms unless the depth of plowing is varied.

Most of the acreage is pine woodland or is used as pasture. The rest is in row crops. Corns, soybeans, truck crops, pasture plants, and pine trees are suited. If the soil is left bare and unprotected, there is a slight hazard of erosion. Under good management that includes row arrangement and the return of crop residue, this soil can be used continuously for row crops. Capability unit IIe-2; woodland group 2o1.

McLaurin fine sandy loam, 5 to 8 percent slopes (MlC).—This is a well-drained soil on ridges and side slopes.

This soil has a surface layer of very dark grayish-brown fine sandy loam about 5 inches thick. The next layer, about 7 inches thick, is dark-brown fine sandy loam. The upper part of the subsoil is yellowish-red sandy loam. The lower

part, below a depth of about 46 inches, is red sandy loam or loam.

Included with this soil in mapping are small areas of Eustis, Poarch, and Ruston soils and a few small areas where the surface layer is loamy sand.

This soil is strongly acid or very strongly acid. Permeability is moderate to moderately rapid, and available water capacity is medium. Runoff is medium. Tilth is easily maintained by proper use of crop residue. A plowpan forms unless the depth of plowing is varied.

Most of the acreage is pine woodland. The rest is used for pasture or row crops. Corn, soybeans, truck crops, pasture plants, and pine trees are suited. Erosion is a hazard where the soil is left bare and unprotected.

Contour cultivation, terraces, and the return of crop residue help to control erosion. This soil is suited to row crops and grasses and legumes in rotations. Capability unit IIIe-1; woodland group 2o1.

Nahunta Series

The Nahunta series consists of somewhat poorly drained soils on stream terraces. These soils formed in loamy material.

In a representative profile the surface layer is very dark gray silt loam about 4 inches thick. The upper part of the subsoil, to a depth of 20 inches, is mainly light olive-brown silt loam that is mottled in the lower part with shades of gray and brown. The middle part, to a depth of 51 inches, is gray silty clay loam mottled with shades of brown. The lower part, to a depth of 60 inches, is mottled, strong-brown, yellowish-brown, and gray silty clay loam.

Representative profile of Nahunta silt loam, five-eighths mile east of U.S. Highway 49 along Wortham (Palmer Creek Campground Road) Road, and 150 feet south of pavement, NW¼SW¼ sec. 32, T. 5 S., R. 11 W.

A1—0 to 4 inches, very dark gray (10YR 3/1) silt loam; weak, fine, granular structure; friable; common fine roots; somewhat compacted; very strongly acid; abrupt, smooth boundary.

B1—4 to 8 inches, light yellowish-brown (2.5Y 6/4) silt loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; common fine root or insect holes containing very dark gray material; somewhat compacted; very strongly acid; clear, smooth boundary.

B21t—8 to 13 inches, light olive-brown (2.5Y 5/4) silt loam; common, medium, distinct, light brownish-gray (10YR 6/2) mottles and few fine, faint, yellowish-brown mottles; moderate, fine and medium, subangular blocky and angular blocky structure; friable; few fine roots; patchy clay films on ped faces; common fine root or insect holes; very strongly acid; clear, smooth boundary.

B22t—13 to 20 inches, mottled light olive-brown (2.5Y 5/4), light brownish-gray (10YR 6/2), and yellowish-brown (10YR 5/8) silt loam; moderate, medium and fine, angular blocky structure; firm, slightly sticky; patchy clay films on ped faces; few fine roots; very strongly acid; gradual, wavy boundary.

B23t—20 to 51 inches, gray (10YR 6/1) silty clay loam; common, medium, distinct, yellowish-brown (10YR 5/8) mottles; strong, medium and coarse, angular blocky structure; firm, slightly plastic and slightly sticky; few fine roots; clay films on ped faces; very strongly acid; gradual, wavy boundary.

B24t—51 to 60 inches, mottled strong-brown (7.5YR 5/8), gray (10YR 6/1), and yellowish-brown (10YR 5/4) silty clay loam; moderate, medium and coarse, angular and subangular blocky structure; firm, slightly plastic and slightly sticky; clay films on ped faces; very strongly acid.

The Ap and A1 horizons are black, very dark gray, or dark gray. The A2 horizon, where present, is dark grayish brown or grayish brown. The upper part of the Bt horizon is light olive brown or yellowish brown and has few to many mottles in shades of gray and brown. The lower part of the Bt horizon is gray or light gray and has common to many mottles in shades of yellow through red. The Bt horizon is silty clay loam, clay loam, loam, or silt loam. Reaction is strongly or very strongly acid throughout the soil.

Nahunta soils are associated wth Nugent, Ruston, and Saucier soils. They differ from Nugent soils in being finer textured throughout their profile and in having a Bt horizon. They are more poorly drained than Ruston and Saucier soils. They do not have plinthite in the Bt horizon, but the Saucier soils do.

Nahunta silt loam (Nh).—This is a somewhat poorly drained soil on low ridges or stream terraces. Slopes are 0 to 2 percent.

Included with this soil in mapping are small areas of Nugent and Saucier soils and a few small areas where the surface layer is fine sandy loam or loam.

The soil is strongly acid or very strongly acid. Permeability is moderately slow, and available water capacity is high. Runoff is slow. These soils are flooded occasionally during periods of heavy rainfall.

Most of the acreage is in pine or low grade hardwood trees. The rest is idle or is used for pasture or urban purposes. Pasture plants, ornamental shrubs, lawn grasses, and pine trees are suited. Water is a hazard during wet periods, but that hazard can be controlled by a surface drainage system. Hardwoods can be improved by suppressing the understory. Capability unit IIw-2; woodland group 2w8.

Nugent Series

The Nugent series consists of excessively drained, stratified soils that formed in sandy materials on flood plains.

In a representative profile the surface layer is dark grayish-brown fine sandy loam about 3 inches thick. The underlying material is dark yellowish-brown fine sandy loam that is stratified with loamy sand to a depth of 8 inches and dominantly pale-brown loamy sand and very fine sandy loam that has strata of silt loam to a depth of 60 inches.

Representative profile of Nugent fine sandy loam from an area of Nugent and Jena soils about 500 feet northeast of south end of bridge across Biloxi River on U.S. Highway 49 in SE¼SE¼ sec. 31, T. 5 S., R. 11 W.

A1—0 to 3 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; very strongly acid; clear, smooth boundary.

C1—3 to 8 inches, dark yellowish-brown (10YR 4/4) fine sandy loam; structureless; very friable; thin strata of loamy sand; few fine roots; strongly acid; gradual, smooth boundary.

C2—8 to 14 inches, pale-brown (10YR 6/3) loamy sand; structureless; loose; thin strata of silt loam; few fine roots; strongly acid; clear, smooth boundary.

C3—14 to 25 inches, brown (10YR 5/3) very fine sandy loam; structureless; very friable; thin strata of loamy sand; few fine roots; strongly acid; clear, smooth boundary.

C4—25 to 41 inches, pale-brown (10YR 6/3) loamy sand; structureless; loose; thin strata of silt loam; few fine roots; strongly acid; clear, smooth boundary.

C5—41 to 48 inches, pale-brown (10YR 6/3) silt loam; struc-

tureless; very friable; thin strata of loamy sand; few fine roots; strongly acid; clear, smooth boundary.

C6—48 to 60 inches, very pale brown (10YR 7/3) loamy sand; structureless; loose; thin strata of silt loam; few fine roots; strongly acid.

The A horizon is dark grayish brown, dark brown, or brown. Its texture is dominantly fine sandy loam, loamy sand, or loamy fine sand, but it ranges to silt loam. The C horizon is dark yellowish brown, yellowish brown, pale brown, very pale brown, or brown. This horizon is dominantly sand or loamy sand and contains thin strata of loamy very fine sand, loam, very fine sandy loam, or silt loam. Reaction of the soil ranges from very strongly acid to slightly acid.

Nugent soils are associated with Jena, Nahunta, and Plummer soils. Nugent soils are more stratified throughout the profile than Jena and Nahunta soils, which have a B horizon and are more sandy. They are better drained than Plummer soils and have stratification which those soils do not have.

Nugent and Jena soils (Nu).—This mapping unit is on the flood plains of creeks and rivers. It is about 46 percent Nugent soils, 20 percent Jena soils, and 34 percent minor soils, similar to Jena soils, but which are mottled with shades of gray within a depth of 20 inches and poorly drained soils that are dominantly gray. The landscape, which is low and densely forested with mixed pine and hardwoods, has many sand bars, oxbow lakes, old river runs, and narrow sloughs. Floods occur several times each year. Slopes range from 0 to 5 percent. Mapped areas are large and range from about 15 to 400 acres in size. Nugent and Jena soils occur together without regularity of pattern. Many areas contain both soils and some or all of the less extensive soils. Some areas contain either of the two major soils along both less extensive soils.

The Nugent soil is next to the stream channels. It is excessively drained and is strongly acid to slightly acid. Permeability is moderately rapid. The available water capacity is low. This soil has the profile described as representative of the series, but the surface layer ranges from fine sandy loam to loamy sand.

The Jena soil is at high elevations in the vicinity of, but generally not adjoining, the stream channels. It is well drained and strongly acid or very strongly acid. Permeability is moderate to moderately rapid. The available water capacity is medium. This soil has the profile described as representative for the series. The surface layer is fine sandy loam or loamy sand.

These soils are used mostly for growing trees. Many summer cottages are built in higher areas near navigable waters. Because these soils flood frequently, they are poorly suited to cultivated crops or pasture. They are well suited to southern hardwoods and southern pines. In areas where slope allows surface water to run off, loblolly, slash, and spruce pines, white oaks, magnolias, sweetgum, and red oaks grow. Nearly level soils support, in addition to the above species, water oak, hickory, and tupelo. Soils in old sloughs support water tupelo and bald cypress. The excessively drained areas next to the streams grow yellow-poplar, black cherry, river birch, hackberry, and sugarberry, in addition to some of the trees mentioned above.

Potential productivity is high to very high. Understory invasion of woody stems is very rapid. Site preparation for tree planting is good for only one season. Natural regeneration is easy to obtain if proper cutting methods are used. Logging is restricted somewhat by flooding. Nugent soils in capability unit Vw–1, woodland group 2s8; Jena soils in capability unit Vw–1, woodland group 1o7.

Ocilla Series

The Ocilla series consists of somewhat poorly drained soils on uplands. These soils have a thick, sandy surface layer over loamy material.

In a representative profile the surface layer is black loamy sand about 5 inches thick. The next layer, about 16 inches thick, is loamy sand that is dark gray in the upper part and mottled with shades of brown in the lower part. The subsoil, to a depth of 67 inches, is sandy loam mottled with shades of brown, gray, and red.

Representative profile of Ocilla loamy sand, north of Long Beach, about a half mile west of Klondike Road along 28th Street, and 100 feet north of roadway, SW¼ SE¼ sec. 35, T. 7 S., R. 12 W.

O1—2 inches to 0, layer of pine needles, leaves, twigs, and grass.

A1—0 to 5 inches, black (10YR 2/1) loamy sand; weak, fine, granular structure; very friable; few fine and medium roots; common fine worm casts; strongly acid; abrupt, smooth boundary.

A21—5 to 12 inches, dark-gray (10YR 4/1) loamy sand; few, fine, distinct, dark yellowish-brown (10YR 4/4) mottles and common, fine, faint, brown mottles; weak, fine, granular structure; very friable; few fine roots; few fine worm casts; strongly acid; irregular, smooth boundary.

A22—12 to 21 inches, mottled dark grayish-brown (10YR 4/2), pale-brown (10YR 6/3), and yellowish-brown (10YR 5/6) loamy sand; weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, smooth boundary.

B21t—21 to 35 inches, mottled yellowish-brown (10YR 5/6), gray (10YR 6/1), and light yellowish-brown (2.5Y 6/4) sandy loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; common coarse pockets of uncoated sand grains; some clay coating of sand grains; very strongly acid; clear, wavy boundary.

B22t—35 to 45 inches, mottled strong-brown (7.5YR 5/8), gray (10YR 6/1), and yellowish-red (5YR 4/6) sandy loam; weak, fine and medium, subangular blocky structure; friable; about 15 percent, by volume, is gray (10YR 6/1) material in coarse vertical pockets; clay coating and bridging of sand grains; very strongly acid; clear, wavy boundary.

B23t—45 to 55 inches, yellowish-brown (10YR 5/6) sandy loam; many, medium, faint, light yellowish-brown (10YR 6/4) mottles and common, coarse, distinct, light brownish-gray (10YR 6/2) mottles; weak, fine and medium, subangular blocky structure; friable; clay coating and bridging of sand grains; about 12 percent, by volume, is light brownish-gray (10YR 6/2) sandy loam; very strongly acid; gradual, wavy boundary.

B3—55 to 67 inches, mottled yellowish-brown (10YR 5/8) and light brownish-gray (10YR 6/2) sandy loam; weak, fine and medium, subangular structure; friable; some clay coating of sand grains; very strongly acid.

The A horizon is sandy and ranges from 21 to 36 inches in thickness. The A1 horizon is very dark gray, dark gray, or black. The A2 horizon is dark gray, gray, dark grayish brown, or light brownish gray and is mottled in shades of brown. The B2t horizon is yellowish brown, light yellowish brown, light olive brown, or pale brown and has few to many grayish mottles, or the horizon is mottled in shades of brown, gray, and red. Texture is sandy loam, sandy clay loam, or loam. The B3 horizon is mottled in shades of brown, gray, and red. Texture is sandy loam, loam, or sandy clay loam. Reaction of the soil is strongly acid or very strongly acid. Hard, medium, sesquioxide nodules are common to absent in the lower horizons.

Ocilla soils are associated with Atmore, Plummer, and Susquehanna soils. They have a thicker and more sandy A horizon and browner B horizon than Atmore soils. They have a thinner A horizon than Plummer soils and are browner in the upper

part of the B horizon than the poorly drained Plummer soils. They differ from Susquehanna soils in having a coarser texture throughout.

Ocilla loamy sand (Oc).—This is a somewhat poorly drained soil on broad flats. Slopes are 0 to 2 percent. Included in mapping are small areas of Atmore, Harleston, and Plummer soils.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is low to medium. Runoff is slow.

More than half the acreage is pine woodland (fig. 10). The rest is used for urban purposes or pasture or is idle. Pasture plants, ornamental shrubs, lawn grasses, and pine trees are suited. Soil blowing is a hazard on bare and unprotected soil during dry periods. Water is a hazard during wet periods, and a water disposal system is needed. Capability unit IIIw-1; woodland group 3o2.

Plummer Series

The Plummer series consists of poorly drained soils that have a thick sandy surface layer over loamy materials.

In a representative profile the surface layer is very dark gray loamy sand about 5 inches thick. The next layer is loamy sand 38 inches thick. It is mottled dark gray and very dark gray in the upper 11 inches and is gray, mottled with shades of brown, in the lower part. The subsoil is sandy loam about 21 inches thick. It is gray with mottles in shades of brown in the upper part, and mottled grayish and brownish in the lower part. The underlying material, between depths of 64 and 72 inches, is loamy sand mottled in shades of yellow, brown, and gray.

Representative profile of Plummer loamy sand, north of Pass Christian, about 0.3 mile west of Menge Avenue along Jones Road, and 200 feet north of roadway, SE¼SE¼ sec. 18, T. 8 S., R. 12 W.

A1—0 to 5 inches, very dark gray (10YR 3/1) loamy sand; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, smooth boundary.

A21g—5 to 16 inches, mottled dark-gray (10YR 4/1) and very dark gray (10YR 3/1) loamy sand; few, fine, distinct, yellowish-brown mottles; weak, fine, granular structure; very friable; common fine roots; strongly acid; clear, wavy boundary.

A22g—16 to 23 inches, gray (10YR 5/1) loamy sand; common,

Figure 10.—Longleaf pine on Ocilla loamy sand. Such trees produce timber and naval stores.

medium, distinct, yellowish-brown (10YR 5/8) mottles and few, fine, distinct, dark yellowish-brown mottles; weak, fine, granular structure; very friable; few fine roots; strongly acid; gradual, smooth boundary.

A23g—23 to 32 inches, gray (10YR 6/1) loamy sand; many, medium, distinct, light yellowish-brown (2.5Y 6/4) mottles and common, medium, distinct, yellowish-brown (10YR 5/8) mottles; weak, fine, granular structure; very friable; few fine roots; strongly acid; clear, wavy boundary.

A24g—32 to 43 inches, mottled gray (10YR 6/1), yellowish-brown (10YR 5/8), and light olive-brown (2.5Y 5/4) loamy sand; weak, fine, granular structure; very friable; few fine roots; strongly acid; gradual, wavy boundary.

B21tg—43 to 50 inches, gray (10YR 6/1) sandy loam; many, medium, distinct, brown (10YR 5/3) mottles and light yellowish-brown (2.5Y 6/4) mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; strongly acid; gradual, wavy boundary.

B22tg—50 to 64 inches, mottled grayish-brown (10YR 5/2), strong-brown (7.5YR 5/8), gray (10YR 5/1), and light olive-brown (2.5Y 5/4) sandy loam; weak, fine, subangular blocky structure; very friable; few medium clay pockets and bands; clay bridging and coating of sand grains; coarse, flat, vertical cracks filled with gray (10YR 6/1) loamy sand material, extending downward; very strongly acid; clear, smooth boundary.

C—64 to 72 inches, mottled brownish-yellow (10YR 6/6), yellowish-brown (10YR 5/6), and light-gray (10YR 7/2) loamy sand; structureless; very friable; very strongly acid.

The A horizon ranges from 40 to 47 inches in thickness. The Ap or A1 horizon is very dark gray or black. The A2 horizon is dark gray, gray, or light brownish gray and has brownish or grayish mottles. The Bt horizon is dark gray, gray, or light brownish gray mottled with shades of brown, yellow, and red. The lower part of the Bt horizon has these colors or is mottled. The Bt horizon is fine sandy loam, sandy loam, or sandy clay loam. The C horizon is mottled in shades of yellow, brown, and gray or is gray mottled in shades of brown. Reaction of the soil is strongly acid or very strongly acid throughout.

Plummer soils are associated with Atmore, Nugent, and Ocilla soils. They have a thicker, sandier A horizon than the Atmore soils, and lack a horizon that is more than 5 percent plinthite above the 60-inch depth. They are more poorly drained than Nugent soils and lack the stratification. They have a thicker A horizon and are more gray in the upper part of the B horizon than the Ocilla soils.

Plummer loamy sand (Pm).—This is a poorly drained soil on wet flats and in drainageways. Slopes are 0 to 2 percent. Included in mapping are small areas of Atmore, Nugent, and Ocilla soils.

This soil is strongly acid or very strongly acid. Permeability of the surface and subsurface layers is rapid, and permeability of the subsoil is moderate. The available water capacity is low. Runoff is slow or very slow.

More than half the acreage is pine woodland. The rest is in urban areas or is used for pasture. This soil is suited to pasture plants and lawn grasses. Excessive wetness is a hazard. Surface drainage is needed in pasture areas. Capability unit IVw-2; woodland group 2w3.

Poarch Series

The Poarch series consists of well-drained soils that formed in loamy materials. These soils are on uplands. Slopes are 0 to 17 percent.

In a representative profile the surface layer is very dark grayish brown fine sandy loam about 5 inches thick. The upper part of the subsoil, to a depth of 52 inches, is yellowish-brown fine sandy loam that has strong-brown mottles in the lower part. The middle part, to a depth of 59 inches, is fine sandy loam mottled with shades of brown, red, and gray. The lower part of the subsoil, to a depth of 84 inches, is brittle and compact fine sandy loam or sandy clay loam that is mottled with shades of brown, gray, and red or has a matrix color of strong brown.

Representative profile of Poarch fine sandy loam, 0 to 2 percent slopes, 1.1 miles north of State Highway 67 at Cedar Lake, along blacktop road, and 70 yards west in a pasture, NW¼NE¼ sec. 36, T. 6 S., R. 10 W.

Ap—0 to 5 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, fine, granular structure; very friable; many fine roots; mixing of B21t horizon in lower part; very strongly acid; abrupt, smooth boundary.

B21t—5 to 11 inches, yellowish-brown (10YR 5/6) fine sandy loam; weak, medium, subangular blocky structure; friable; common fine roots; common sand grains coated and bridged with clay; common pockets of uncoated sand grains betwen peds; common fine pores; few medium plinthite nodules; some mixing of Ap horizon material in upper part; very strongly acid; gradual, smooth boundary.

B22t—11 to 35 inches, yellowish-brown (10YR 5/6) fine sandy loam, weak, medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; clay films in some pores and on browner peds; few medium plinthite nodules; very strongly acid; gradual, smooth boundary.

B23t—35 to 43 inches, yellowish-brown (10YR 5/6) fine sandy loam; common, coarse, faint, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; few fine roots; sand grains coated and bridged with clay; common pockets of uncoated sand grains between peds; few medium plinthite nodules; very strongly acid; gradual, smooth boundary.

B24t—43 to 52 inches, yellowish-brown (10YR 5/6) fine sandy loam; common, coarse, faint, strong-brown (7.5YR 5/6) mottles; weak, medium, subangular blocky structure; friable; phinthite areas are brittle and compact; thin patchy clay films on peds; peds bridged and coated with clay; common pockets of uncoated sand grains; few medium plinthite nodules; very strongly acid; clear, smooth boundary.

B25t—52 to 59 inches, mottled strong-brown (7.5YR 5/6), yellowish-brown (10YR 5/6), dark-red (2.5YR 3/6), gray (10YR 6/1), and light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, coarse, prismatic structure parting to weak, medium, subangular blocky structure; firm, brittle and compact in plinthite areas; thin patchy clay films on ped faces; few fine voids; prisms surrounded by 2- to 4-centimeter seams of uncoated sand grains; about 5 percent medium plinthite nodules; very strongly acid; gradual, smooth boundary.

B26t—59 to 73 inches, mottled strong-brown (7.5YR 5/6), gray (10YR 6/1), dark-red (2.5YR 3/6), and light yellowish-brown (2.5Y 6/4) fine sandy loam; weak, medium, platy structure; firm, brittle and compact; few fine voids; thin patchy clay films on ped faces; seams of uncoated sandy loam 2- to 4-centimeters wide in tubular and irregular pattern; 5 to 10 percent medium plinthite nodules; very strongly acid; gradual, smooth boundary.

B27t—73 to 84 inches, strong-brown (7.5YR 5/8) sandy clay loam; common, coarse, prominent, dark-red (10R 3/6) and gray (N 6/0) mottles; weak, medium, platy structure; firm, slightly brittle and compact; thin patchy clay films on ped faces; gray seams and pockets of heavy loam in irregular and tubular patterns; few medium plinthite nodules; very strongly acid.

The solum ranges from 80 to more than 90 inches in thickness. Reddish spheroidal masses of plinthite range from 5 to

15 percent and occur between depths of 40 to 60 inches. The A horizon is very dark gray, very dark grayish brown, dark gray, dark brown, or dark grayish brown. The upper part of the B2t horizon is fine sandy loam, sandy loam or loam that is yellowish brown, light yellowish brown, brownish yellow, or light olive brown. Gray mottles are in some places below the 30-inch depth. The lower part of the B2t horizon is mottled with shades of brown, gray, and red or has strong-brown, yellowish-brown, light yellowish-brown, or light olive-brown colors that are mottled. Reaction of the soil is strongly acid or very strongly acid.

Poarch soils are associated with Harleston, Lakeland, and Smithdale soils. They are like Harleston soils in that they lack gray mottles above the 30-inch depth. In contrast with Lakeland soils, they have a Bt horizon and are less sandy throughout. They are not so red as Smithdale soils and are coarser in texture in the upper part of the Bt horizon.

Poarch fine sandy loam, 0 to 2 percent slopes (PoA).—This is a well-drained soil on broad upland flats. It has the profile described as representative of the series. Included in mapping are small areas of Harleston and Smithdale soils.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part of the subsoil and moderately slow in the lower part. The available water capacity is medium. Runoff is slow. Tilth is easily maintained by proper use of crop residues. A plowplan forms unless the depth of plowing is varied.

More than half the acreage is pine woodland. The rest is in urban areas or is used for row crops. Corn, soybeans, truck crops, pasture plants (fig. 11) and pine trees are suited. Under good management that includes row arrangement and return of crop residue, the soil can be used year after year for row crops. Capability unit I-1; woodland group 2o1.

Poarch fine sandy loam, 2 to 5 percent slopes (PoB).—This is a well-drained soil on ridges. Included with this soil in mapping are small areas of Harleston, Latonia, Saucier, and Smithdale soils. Also included are small areas of soils similar to Poarch soils, but the surface layer is loamy fine sand.

The surface layer is very dark grayish-brown fine sandy loam about 4 inches thick. The subsoil extends to a depth of 84 inches. The upper 5 inches is dark grayish-brown fine sandy loam, and the next 47 inches is yellowish-brown sandy loam. Below this is a brittle and compact sandy clay loam layer mottled with shades of brown, red, and gray.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part and moderately slow

Figure 11.—Cattle grazing on bahiagrass on Poarch fine sandy loam, 0 to 2 percent slopes.

in the lower part. Available water capacity is medium. Runoff is slow to medium.

Tilth is easily maintained by proper use of crop residues. A plowpan forms unless the depth of plowing is varied.

More than half the acreage is pine woodland. The rest is used for urban purposes, pasture, or row crops. Corn, soybeans, truck crops, pasture plants (fig. 12), and pine trees are suited. If the soil is left bare and unprotected, there is a slight hazard of erosion. Under good management that includes row arrangement and return of crop residue, the soil can be used year after year for row crops. Capability unit IIe-2; woodland group 2o1.

Poarch fine sandy loam, 5 to 12 percent slopes (PoC).—This is a well-drained soil on side slopes. Included in mapping are small areas of Harleston, Smithdale, and Smithton soils.

This soil has a dark-brown surface layer about 8 inches thick. The upper part of the subsoil is yellowish-brown sandy loam. The lower part, at depths below 50 inches, is brittle and compact sandy clay loam that is mottled with shades of brown, gray, and red.

This soil is strongly acid or very strongly acid. Permeability is moderate in the upper part but moderately slow in the lower part. The available water capacity is medium. Runoff is medium to rapid.

Most of the acreage is woodland. The rest is used for pasture or building sites. Corn, soybeans, pasture plants, ornamental shrubs, and pine trees are suited. Erosion is a hazard where the soil is left bare and unprotected. Permanent vegetation is needed most of the time. Capability unit IVe-1; woodland group 2o1.

Ponzer Series

The Ponzer series consists of very poorly drained soils that have a thick, dark mucky surface layer over loamy material. These soils are on flood plains.

In a representative profile the surface layer is black

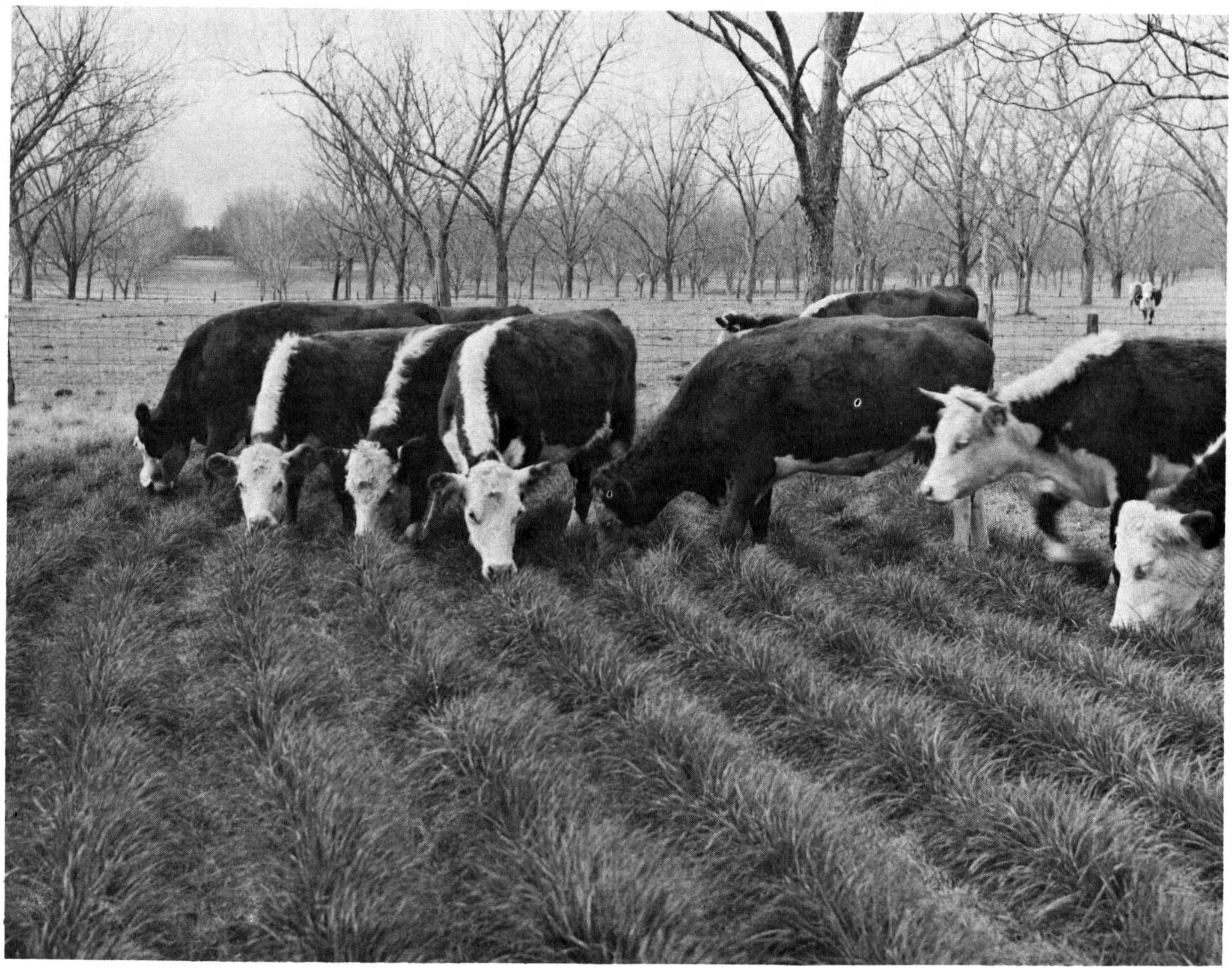

Figure 12.—**Drilled oats on Poarch fine sandy loam, 2 to 5 percent slopes, provide winter grazing for beef cattle.**

muck about 18 inches thick. The underlying material is fine sandy loam to a depth of 60 inches. It is very dark gray to very dark grayish brown in the upper part and gray in the lower part.

Representative profile of Ponzer soil from an area of Ponzer and Smithton soils, 7 miles northwest of Back Bay Bridge along State Highway 67, and 2,000 feet east along Mississippi Power Company transmission line right-of-way, SW¼SW¼ sec. 25, T. 6 S., R. 10 W.

Oa—0 to 18 inches, sapric material, black (10YR 2/1) broken face and rubbed; about 25 percent fiber, 2 percent rubbed; weak, fine, granular structure; friable; common fine roots; extremely acid; clear, wavy boundary.

IIC1—18 to 24 inches, very dark gray (10YR 3/1) fine sandy loam; common, fine, faint, black mottles; weak, fine, granular structure; friable; few fine roots; extremely acid; clear, wavy boundary.

IIC2—24 to 38 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; structureless; friable few fine roots; very strongly acid; clear, wavy boundary.

IIC3g—38 to 60 inches, gray (10YR 6/1) fine sandy loam; structureless; friable; lenses and pockets of loamy sand; few fine roots; strongly acid.

The organic material ranges from 16 to 40 inches in thickness. The Oa horizon ranges from very dark brown to black. The IIC horizon is very dark gray and very dark grayish brown to gray. Texture is fine sandy loam, loam, or silt loam. Reaction of the soil ranges from strongly acid to extremely acid.

Ponzer soils are associated with Handsboro, Hyde, Smithton, and St. Lucie soils. They have thick mineral layers above a depth of 51 inches but Handsboro soils do not. They also lack the sulfur content within a depth of 12 to 40 inches that is characteristic of the Handsboro soils. Ponzer soils have an organic surface layer, whereas Hyde and Smithton soils have a mineral surface layer. They are very poorly drained and have a thick, organic surface layer, but St. Lucie soils are sandy and excessively drained.

In this county the soils classified in the Ponzer series are outside the range defined for the series in that they have siliceous mineralogy. This difference does not affect their use and management.

Ponzer and Smithton soils (Ps).—This mapping unit is on densely forested, low, wet flats, or depressions. It is about 59 percent Ponzer soils, 18 percent Smithton soils, and 23 percent Handsboro, Hyde, St. Lucie, and similar soils of minor extent.

These soils are subject to flooding and are covered by standing water for long periods. These areas are along minor streams and intermittent drainageways in most parts of the county. Slopes are 0 to 2 percent. Areas range from about 15 to over 300 acres. The delineations are more generalized than those of a detailed mapping unit that contains only one soil.

The Ponzer and Smithton soils occur together without regularity of pattern. Many areas are made up of both major soils and some or all of the less extensive soils. Some areas contain either of the two major soils along with less extensive soils.

The Ponzer soil occurs in lower lying level areas and in depressions subject to flooding. It has the profile described as representative of the series. It is very poorly drained and strongly acid to extremely acid. Permeability is moderate, and available water capacity is high.

The Smithton soil occurs on low-lying flats and in drainageways but at elevations slightly higher than the very poorly drained Ponzer soil. It is poorly drained, and it is flooded for shorter periods than the Ponzer soils, even though the water table is at or near the surface for long periods. The surface layer of this soil is about 14 inches thick. It is very dark grayish-brown fine sandy loam, which grades to gray loam below a depth of about 3 inches. The subsoil is gray loam mottled with shades of brown. Smithton soil is strongly acid or very strongly acid. Permeability is moderate to moderately slow, and available water capacity is medium.

These soils are used chiefly for growing hardwood and pine trees. Because of wetness and the frequency of flooding, they are not well suited to cultivated crops or pasture. They are better suited to hardwoods, with only scattered slash and loblolly pines. The Ponzer soils of this unit support southern sweetbay, sweetbay, magnolia, and swamp blackgum fairly well (fig. 13). Understory plants are red maple, star bush, titi, and similar species. The Smithton soils along the drainageways support the same species as Ponzer soils, but areas where surface water can run off are high-producing sites for both slash and loblolly pines. These areas also have sweetgum, green ash, red oak, and white oak. The poorly drained, low-lying soils on flats that have the water table near the surface produce slash pine, tupelos, and pond cypress. Planting is recommended only in areas where surface drainage occurs or has been provided. Ponzer soils in capability unit VIIw–1, woodland

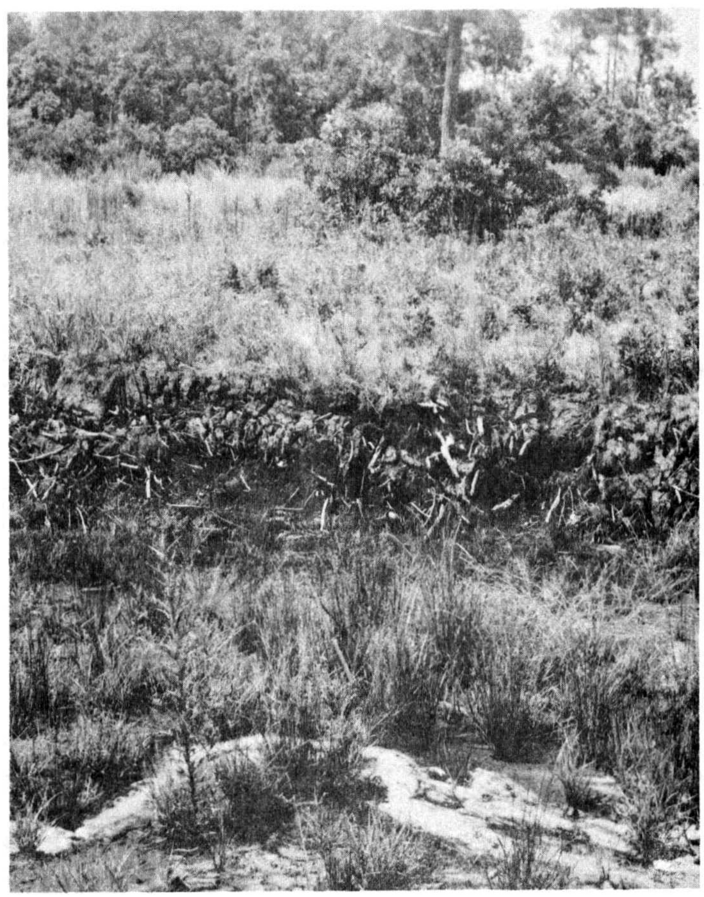

Figure 13.—Drainage ditch for removing excess water on Ponzer soil. Undrained Ponzer soil supports only water-tolerant vegetation in most places.

group 4w3; Smithton soils in capability unit Vw-2, woodland group 2w9.

Ruston Series

The Ruston soils are well-drained soils that formed in loamy materials. These soils are on uplands. Slopes range from 0 to 12 percent.

In a representative profile the surface layer is very dark gray fine sandy loam about 4 inches thick. The next layer is dark-brown fine sandy loam 8 inches thick. The upper part of the subsoil, to a depth of 48 inches, is mainly red sandy clay loam, the middle part, to a depth of 59 inches, is red fine sandy loam, and the lower part, to a depth of 81 inches, is red to dark-red sandy clay loam.

Representative profile of Ruston fine sandy loam, 2 to 5 percent slopes, 1.2 miles southwest of State Highway 67, along Harrison Experimental Forest Road H-2, and 120 feet east of roadway, NW¼NW¼ sec. 14, T. 5 S., R. 11 W.

O1—2 inches to 0, partly decomposed pine needles and deciduous leaves and twigs.

A1—0 to 4 inches, very dark gray (10YR 3/1) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; medium acid; clear, smooth boundary.

A2—4 to 8 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; friable; few fine roots; many fine particles of material like A1 horizon; strongly acid; clear, smooth boundary.

B1—8 to 12 inches, dark-brown (7.5YR 4/4) fine sandy loam; weak, fine, granular structure; friable; few fine roots; common medium root channels filled with dark yellowish-brown material; strongly acid; gradual, smooth boundary.

B21t—12 to 31 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium and fine, subangular blocky structure; friable; few fine roots; thin patchy clay films on ped faces; strongly acid; gradual, smooth boundary.

B22t—31 to 48 inches, red (2.5YR 4/6) sandy clay loam; moderate, medium and fine, subangular blocky structure; friable; few fine roots; thin patchy clay films on ped faces; strongly acid; gradual, smooth boundary.

B23t—48 to 59 inches, red (2.5YR 5/6) fine sandy loam; weak, medium and fine, subangular blocky structure; friable; few fine roots; strongly acid; gradual, smooth boundary.

B24t—59 to 70 inches, red (2.5YR 5/6) sandy clay loam; moderate, medium and fine, subangular blocky structure; friable; thin patchy clay films on ped faces; few medium pockets of fine sandy loam; very strongly acid; gradual, wavy boundary.

B25t—70 to 81 inches, dark-red (2.5YR 3/6) sandy clay loam; moderate, medium and fine, subangular blocky structure; friable; thin patchy clay films on ped faces; few medium pockets of fine sandy loam; few fine sesquioxide nodules; very strongly acid.

The A1 horizon is very dark gray, dark grayish brown, or very dark grayish brown. The Ap, A2, and B1 horizons are brown, dark brown, yellowish brown, or dark yellowish brown. The B2t horizon is yellowish red, red, or dark red. Its texture is loam, fine sandy loam, sandy clay loam, or clay loam and the content of clay in the upper 20 inches ranges from 20 to 33 percent. The A'2 and B'2t horizons are in some profiles. In such places the A'2 horizon is yellowish red or red and has pale-brown or brown mottles. Texture is sandy loam or loamy sand. The B't horizon is yellowish red, red, or dark red mottled with strong brown. Its texture is loam, sandy clay loam, or clay loam. Reaction of the soil is strongly acid or very strongly acid.

Ruston soils are associated with McLaurin, Nahunta, and Smithdale soils. They have a finer texture in their B horizon than McLaurin soils. They are better drained than Nahunta soils. They are finer textured in the lower part of the Bt horizon than Smithdale soils.

Ruston fine sandy loam, 0 to 2 percent slopes (RuA).—This is a well-drained soil on ridgetops. Included in mapping are small areas of McLaurin, Nahunta, and Smithdale soils.

This soil has a surface layer of very dark gray fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish-red sandy clay loam. The lower part, below the 59-inch depth, is strong brown sandy clay loam.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium to high. Runoff is slow. Tilth is easily maintained by proper use of crop residue. A plowpan forms if the soil is plowed at a constant depth.

Most of the acreage is pine woodland or pasture. The rest is used for row crops. Pasture plants, corn, soybeans, lawn grasses, truck crops, ornamental shrubs, and pine trees are suited. Under good management that includes row arrangement and return of crop residue, the soil can be used year after year for row crops. Capability unit I-1; woodland group 2o1.

Ruston fine sandy loam, 2 to 5 percent slopes (RuB).—This is a well-drained soil on ridgetops. It has the profile described as representative of the series. Included in mapping are small areas of McLaurin and Smithdale soils.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium to high. If the soil is left bare and unprotected, there is a slight hazard of erosion. Runoff is slow to medium. Tilth is easily maintained by proper use of crop residue. A plowpan forms if the soil is plowed at a constant depth.

Most of the acreage is pine woodland. The rest is used for pasture or row crops. Pasture, hay, and forage plants (fig. 14), corn, soybeans, lawn grasses, truck crops, ornamental shrubs, and pine trees are suited. Under good management that includes row arrangement and return of crop residue, the soil can be used year after year for row crops. Capability unit IIe-2; woodland group 2o1.

Ruston fine sandy loam, 5 to 8 percent slopes (RuC).—This is a well-drained soil on ridgetops and side slopes. Included in mapping are small areas of McLaurin and Smithdale soils.

This soil has a surface layer of very dark grayish-brown fine sandy loam about 5 inches thick. The next layer, about 9 inches thick, is yellowish-brown fine sandy loam. The upper part of the subsoil is yellowish-red clay loam, and the lower part, below a depth of about 42 inches, is yellowish-red clay loam mottled with yellowish brown.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium to high. If the soil is left bare and unprotected, there is a moderate hazard of erosion. Runoff is medium. Tilth is easily maintained by proper use of crop residue. A plowpan forms if the soil is continually plowed at the same depth.

Most of the acreage is woodland; the rest is in pasture or row crops. Pasture plants, corn, soybeans, lawn grasses, truck crops, ornamental shrubs, and pine trees are suited. If row crops are to be grown, the soil needs good management that includes contour farming, terraces, and return of crop residue. It is suited to row crops and grasses and legumes in rotation. Capability unit IIIe-1; woodland group 2o1.

Figure 14.—A field of pearl millet on Ruston fine sandy loam, 2 to 5 percent slopes. Part of crop has been cut for silage and the rest left for harvest and seed.

Ruston fine sandy loam, 8 to 12 percent slopes (RuD).—This is a well-drained soil on side slopes.

This soil has a surface layer of very dark grayish-brown fine sandy loam about 4 inches thick. The next layer, about 4 inches thick, is dark-brown fine sandy loam. The subsoil, to a depth of 60 inches, is yellowish-red sandy clay loam that is mottled with shades of brown below a depth of about 25 inches.

Included with this soil in mapping are small areas of McLaurin and Smithdale soils and a few areas where rills and a thin A horizon give evidence of accelerated erosion.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium to high. Runoff is medium to rapid. Erosion is a moderate hazard where the soil is left bare and unprotected. Tilth is easily maintained by proper use of crop residue. A plowpan forms if the soil is continually plowed at the same depth.

Most of the acreage is woodland. The rest is used for pasture or is idle. Pasture plants, lawn grasses, ornamental shrubs, row crops, truck crops, and pine trees are suited. If this soil is used for row crops, management needs are row arrangement, terraces, return of crop residue, and rotations of mainly grasses and legumes with row crops. Capability unit IVe-1; woodland group 2o1.

Saucier Series

The Saucier series consists of moderately well drained soils that formed in a thin mantle of loamy material overlying clayey material. These soils are on uplands. Slopes are 2 to 12 percent.

The surface layer is dark grayish-brown fine sandy loam about 5 inches thick. The subsoil extends to a depth of 72 inches. The upper part, to a depth of 38 inches, is yellowish brown, is mainly loam, and is mottled with shades of red, brown, and gray below a depth of about 26 inches. The middle part, to a depth of 60 inches, is clay loam and silty loam mottled with shades of gray, red, and brown. The lower part is clay mottled with shades of gray, brown, and red.

Representative profile of Saucier fine sandy loam, 2 to

5 percent slopes, 1 mile west of Saucier along Saucier-Lizana Road, 2 miles northwest along a local road, and 50 feet south of roadway, SE¼SW¼ sec. 3, T. 5 S., R. 12 W.

A1—0 to 5 inches, dark grayish-brown (10YR 4/2) fine sandy loam; weak, fine, granular structure; friable; common fine roots; few ironstone pebbles; many fine pores; strongly acid; clear, smooth boundary.

B1—5 to 12 inches, yellowish-brown (10YR 5/6) fine sandy loam; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; common root or worm channels filled with dark grayish-brown fine sandy loam; few medium ironstone pebbles; many fine pores; strongly acid; gradual, smooth boundary.

B21t—12 to 26 inches, yellowish-brown (10YR 5/8) loam; moderate, medium, subangular blocky structure; friable, slightly plastic, slightly sticky; few fine roots; patchy clay films on faces of peds; about 2 percent plinthite; common fine pores; very strongly acid; gradual, wavy boundary.

B22t—26 to 38 inches, yellowish-brown (10YR 5/8) loam; common, medium, prominent, dark-red (10R 3/6) mottles, common, medium, distinct, gray (10YR 6/1) mottles, and few, medium, faint, strong-brown (7.5 YR 5/6) mottles; moderate, medium and coarse, angular blocky structure; friable, slightly plastic, slightly sticky; few fine roots; common clay films on faces of peds; about 10 percent plinthite; few pockets of uncoated sand grains; common fine pores; very strongly acid; gradual, wavy boundary.

B23t—38 to 48 inches, mottled yellowish-brown (10YR 5/8), dark-red (10YR 3/6), gray (10R 6/1), and red (2.5 YR 4/8) clay loam; strong, medium and coarse, angular blocky structure; firm, plastic, sticky; few fine roots; common coarse pockets of light yellowish-brown (10YR 6/4) sandy loam; many clay films on peds; extremely acid; gradual, wavy boundary.

B24t—48 to 60 inches, mottled gray (10YR 6/1), dark-red (10R 3/6), yellowish-brown (10YR 5/8) and strong-brown (7.5YR 5/8) silty clay loam; strong, medium and coarse, angular blocky structure; firm, plastic, sticky; few fine roots; many clay films on faces of peds; extremely acid; gradual, wavy boundary.

IIB25t—60 to 72 inches, mottled light-gray (10YR 7/2), strong-brown (7.5YR 5/8), and red (2.5YR 4/6) clay; strong, medium and coarse, angular blocky structure; firm, plastic, sticky; few fine roots; patchy clay films or pressure faces on peds; extremely acid.

Thickness of the solum ranges from 60 to more than 80 inches. Horizons that are 5 to 25 percent nonindurated plinthite occur between depths of 20 and 45 inches. The Ap and A1 horizons are dark grayish brown, very dark grayish brown, or dark brown. Some profiles have an A2 horizon of pale brown, light olive, brown, or grayish brown. The upper part of the B horizon is yellowish-brown, brownish-yellow, or light olive-brown loam or clay loam. Grayish mottles occur within a depth of 30 inches. The lower part of the B horizon is clay loam, silty clay loam, silty clay, or clay mottled with brown, gray, and red. Reaction of the soil ranges from strongly acid through extremely acid.

Saucier soils are associated with Nahunta, Smithton, and Susquehanna soils. They are better drained than Nahunta soils and also differ in containing plinthite in the Bt horizon. They have a browner, finer textured horizon than the gray Smithton soils. They have a less clayey Bt horizon than Susquehanna soils.

Saucier fine sandy loam, 2 to 5 percent slopes (SfB).—This is a moderately well drained soil on ridgetops. It has the profile described as representative of the series. Included in mapping are small areas of Harleston, Poarch, and Ruston soils.

This soil is strongly acid to extremely acid. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is slow to medium. Tilth is easily maintained by proper use of crop residue. A plowpan forms unless the depth of plowing is varied.

More than half the acreage is pine woodland. The rest is used for pasture, truck crops, row crops, or for urban purposes. Pasture plants, corn, soybeans, lawn grasses, truck crops, ornamental shrubs, and pine trees are suited. Soil erosion is a hazard in cultivated areas. Under good management that includes row arrangement and return of crop residue, this soil can be used year after year for row crops. Capability unit IIe–1; woodland group 3w2.

Saucier fine sandy loam, 5 to 8 percent slopes (SfC).—This is a moderately well drained soil on ridgetops and side slopes. Included in mapping are small areas of Harleston, Poarch, and Ruston soils.

This soil has a surface layer of very dark grayish-brown fine sandy loam about 4 inches thick. The upper part of the subsoil is light olive-brown sandy loam that becomes more clayey and more mottled with increasing depth. The lower part, below a depth of 44 inches, is clay loam mottled with gray, red, and brown.

The soil is strongly acid to extremely acid. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is medium. Tilth is easily maintained by proper use of crop residue. A plowpan forms unless the depth of plowing is varied.

More than half the acreage is pine woodland. The rest is used for pasture, row crops, and urban purposes. Pasture plants, corn, soybeans, lawn grasses, truck crops, and pine trees are suited. Erosion is a hazard if the soil is left bare and unprotected. Contour cultivation, terraces, and the return of crop residue are management needs in areas used for row crops. Row crops can be rotated with grasses and legumes. Capibility unit IIIe–1; woodland group 3w2.

Saucier, Smithton, and Susquehanna soils, rolling (ShC).—This mapping unit is on uplands. It is about 33 percent Saucier soil, 13 percent Smithton soil, 9 percent Susquehanna soil, and 45 percent Atmore, Harleston, and Poarch soils. The landscape, chiefly forested, is one of narrow ridgetops and sloping side slopes broken by numerous short drainageways. Areas range from 10 to 90 acres in size. Slopes range from 5 to 12 percent.

Saucier, Smithton, and Susquehanna soils occur together without regularity of pattern. Many areas contain all three of these soils and some or all of the less extensive soils. Nearly all contain Saucier soils and some of the less extensive soils.

The Saucier soil is on the upper slopes. It is moderately well drained and strongly acid to extremely acid. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is medium to rapid. The surface layer is very dark grayish-brown fine sandy loam about 3 inches thick. The upper part of the subsoil is yellowish-brown loam that is mottled with brown, red, and gray below a depth of 21 inches. The lower part of the subsoil, to a depth of 60 inches, is clay mottled with gray, brown, and red.

The Smithton soil is in drainageways. It is poorly drained and strongly acid to very strongly acid. Permeability is moderate to moderately slow. The available water capacity is medium. Runoff is slow. The surface layer is very dark grayish-brown fine sandy loam that is gray below a depth of 5 inches and is about 16 inches thick. The

subsoil is gray fine sandy loam, mottled with shades of brown.

The Susquehanna soil is on middle and low slopes. It is somewhat poorly drained and strongly acid or very strongly acid. Permeability is very slow. The available water capacity is high. Runoff is medium to rapid. The surface layer is very dark grayish-brown fine sandy loam about 4 inches thick. The upper part of the subsoil, to a depth of 11 inches, is a yellowish-brown fine sandy loam. Below this the subsoil is plastic clay mottled with red, brown, and gray. Below a depth of about 34 inches, it is dominantly gray clay.

These soils are used chiefly for growing pine trees. Because they are steep and are broken into smaller areas by numerous short drains, they are not well suited to row crops. They are suited to pasture plants and trees. Rapid runoff and erosion are hazards in bare and unprotected areas. Perennial vegetation of grasses and legumes or trees is needed for erosion control.

These soils are suited to southern pines. The Saucier and Susquehanna soils, which are on uplands, support longleaf, slash, and loblolly pines. Smithton soils, which are on toe slopes and along drainageways, support slash and loblolly pine, red oak, sweetgum, and tupelo. Understory invasion of woody stems is moderate to severe. Principal weeds and understory species on the uplands are blackjack oak, post oak, red oak, gallberry, and waxmyrtle. Along the drainageways, the principal invaders are red maple, titi, waxmyrtle, and black titi. Saucier soils in capability unit IVe–1, woodland group 3w2; Smithton soils in capability unit IIIw–2, woodland group 2w9; Susquehanna soils in capability unit VIe–1, woodland group 3c2.

Saucier-Susquehanna complex, 2 to 5 percent slopes (SnB).—This mapping unit is on ridges and side slopes. It is about 49 percent Saucier soils, 25 percent Susquehanna soils, and 26 percent mainly Harleston and Poarch soils. The landscape is chiefly in pine forest.

The intricate pattern and proportion of Saucier and Susquehanna soils are fairly uniform throughout the mapping unit. They are present in all delineations, and are approximately the same extent in each.

The Saucier soil is on the broad flatter parts of the ridges. It is moderately well drained and strongly acid to extremely acid. Permeability is moderate in the upper part of the subsoil and slow in the lower part. The available water capacity is high. Runoff is slow to medium. The surface layer is very dark grayish-brown fine sandy loam about 3 inches thick. The 3- to 7-inch layer is grayish-brown fine sandy loam. The subsoil is yellowish-brown clay loam mottled with red, brown, and gray. Below a depth of about 41 inches, it is clay mottled with gray, brown, and red.

The Susquehanna soil usually occurs near the edges of the ridges and near slope breaks. It has the profile described as representative of the series. It is somewhat poorly drained and strongly to very strongly acid. Permeability is very slow. The available water capacity is high. Runoff is slow.

Most of the acreage is pine woodland. The rest is in pasture or row crops. Pasture plants, corn, soybeans, lawn grasses, truck crops, ornamental shrubs, and pine trees are suited to poorly suited. Erosion is a hazard where the soil is bare and unprotected. Row arrangement, contour cultivation, terraces, and return of crop residue are needed if row crops are grown. Row crops can be rotated with grasses and legumes.

These soils are suited to southern pines. Longleaf, slash, and loblolly pines grow naturally. Understory invasion of woody stems is moderate. Site preparation lasts 1 year. Blackjack oak, post oak, red oak, gallberry, and waxmyrtle are the principal invaders. Care is needed in locating roads. The Susquehanna soil should be crowned and drained in logging road construction. Capability unit IVe–2; woodland group 3c2.

Smithdale Series

The Smithdale series consists of well-drained soils that formed in loamy materials on uplands.

In a representative profile the surface layer is very dark grayish-brown fine sandy loam about 5 inches thick. The next layer, 5 inches thick, is yellowish-brown fine sandy loam. The upper part of the subsoil, to a depth of 51 inches, is yellowish-red and red sandy clay loam. Below this is red sandy loam.

Representative profile of Smithdale fine sandy loam, 12 to 17 percent slopes, 10 miles southeast of Saucier along State Highway 67, then 1,800 feet southwest along a private road, and 800 feet north of roadway, NE¼NE¼ sec. 35, T. 5 S., R. 11 W.

A1—0 to 5 inches, very dark grayish-brown (10YR 3/2) fine sandy loam; weak, fine, granular structure; very friable; common fine roots; common medium flat pockets of uncoated sand grains; common fine charcoal fragments; strongly acid; clear, wavy boundary.

A2—5 to 10 inches, yellowish-brown (10YR 5/4) fine sandy loam; weak, fine, granular structure; very friable; few fine roots; some mixing with material from A1 horizon in upper 2 inches; strongly acid; gradual, wavy boundary.

B21t—10 to 26 inches, yellowish-red (5YR 4/8) sandy clay loam; many, coarse, faint, red (2.5YR 4/6) mottles in lower part; moderate, fine and medium, angular and subangular blocky structure; friable; few fine roots; thin patchy clay films on peds and in pores; very strongly acid; gradual, wavy boundary.

B22t—26 to 51 inches, red (10R 4/8) sandy clay loam; moderate, fine and medium, angular and subangular blocky structure; friable; few fine roots; thin patchy clay films on peds and in pores; very strongly acid; gradual, wavy boundary.

B23t—51 to 73 inches, red (2.5YR 4/8) sandy loam; common, medium, distinct, brownish-yellow (10YR 6/8) mottles and common, coarse, faint, red (10R 4/6) mottles in lower 6 inches; weak, fine and medium, subangular blocky structure; friable; clay coating and bridging of sand grains; few pockets of uncoated sand grains; very strongly acid; gradual, wavy boundary.

C—73 to 80 inches, red (10R 5/8) sandy loam; massive; very friable; very strongly acid.

The A1 horizon is very dark grayish brown or dark brown. The Ap and A2 horizons are very dark grayish brown, dark grayish brown, dark brown, or yellowish brown. Their texture is fine sandy loam or loamy sand. The Bt horizon is yellowish red or red mottled in shades of yellow and brown in the lower part. Texture is sandy clay loam or sandy loam. The upper 20 inches of the Bt horizon ranges in content of clay from 18 to 33 percent. The C horizon is yellowish red or red. Reaction of the soil is strongly acid or very strongly acid, except in areas that have been limed.

Smithdale soils are associated with McLaurin, Poarch, and Ruston soils. They are finer textured in the B horizon than the McLaurin soils. They are redder and finer textured in the upper

part of the Bt horizon than the Poarch soils. They are coarser textured in the lower part of the Bt horizon than the Ruston soils.

Smithdale fine sandy loam, 12 to 17 percent slopes (SsE).—This is a well-drained soil on side slopes.

Included in mapping are small areas of McLaurin, Poarch, and Ruston soils and a few small areas of soils that have a surface layer of loamy sand about 25 inches thick.

This soil is strongly acid or very strongly acid. Permeability is moderate, and available water capacity is medium. Runoff is rapid.

Most of the acreage is woodland. The rest is used for pasture or is idle. Pasture plants, lawn grasses, ornamental shrubs, and pine trees are well suited. Because of its slope and erodibility, this soil should be kept in permanent vegetation. It is well suited to loblolly, slash, and longleaf pines. Invasion of understory woody stems is moderate. Site preparation generally lasts about two years. Undesirable species are bluejack and blackjacks, dwarf post oak, and turkey oak. Capability unit VIe–2; woodland group 2o1.

Smithton Series

The Smithton series consists of poorly drained soils that formed in loamy materials.

The surface layer is very dark gray fine sandy loam about 4 inches thick. The next layer is 24 inches of very dark gray, dark gray, or gray mainly fine sandy loam mottled with shades of brown and red. The upper part of the subsoil, to a depth of 55 inches, is gray sandy loam, mottled with shades of brown and red. The lower part, to a depth of 72 inches, is yellowish-brown sandy loam and loam mottled with shades of gray and red.

Representative profile of Smithton fine sandy loam, five-eighths mile north of Dedeaux Road along Three Rivers Road, then east 350 yards along paved local road, and 50 yards south of roadway, NW¼NW¼ sec. 11, T. 7 S., R. 11 W.

A11—0 to 4 inches, very dark gray (10YR 3/1) fine sandy loam; common, fine, faint mottles of gray; weak, fine, granular structure; very friable; common fine roots; few coarse crawfish holes; very strongly acid; clear, smooth boundary.

A12—4 to 9 inches, mottled very dark gray (10YR 3/1), dark gray (10YR 4/1), and dark brown (7.5YR 4/4) fine sandy loam; weak, fine, granular structure; very friable; few fine roots; few coarse crawfish holes; strongly acid; clear, smooth boundary.

A21g—9 to 19 inches, dark-gray (10YR 4/1) fine sandy loam, common, fine, faint, dark yellowish-brown mottles and few, fine, distinct, yellowish-red mottles; weak, fine, granular structure; very friable; few fine roots; very strongly acid; clear, smooth boundary.

A22g—19 to 28 inches, gray (10YR 5/1) sandy loam; common, medium, distinct, yellowish-brown (10YR 5/6) mottles and few, fine, distinct, yellowish-red mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots; common medium pockets of uncoated pale-brown sandy material; very strongly acid; clear, smooth boundary.

A23g&Bg—28 to 39 inches, gray (10YR 5/1) sandy loam; many medium, distinct, light olive-brown (2.5Y 5/4) mottles and common, medium, distinct, light yellowish-brown (10YR 6/4) mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots; some clay bridging and coating of sand grains; common medium pockets of uncoated sandy material; very strongly acid; gradual, smooth boundary.

B21tg—39 to 45 inches, gray (10YR 5/1) sandy loam; many medium, distinct, light yellowish-brown (10YR 6/4) mottles and common, medium, distinct, yellowish-brown (10YR 5/6) mottles; weak, fine and medium, subangular blocky structure; friable; few fine roots; clay bridging and coating of sand grains; common medium pockets of uncoated sandy materials; common, coarse, thin, very pale brown (10YR 7/3) tongues of uncoated sandy material; very strongly acid; abrupt, irregular boundary.

B22tg—45 to 55 inches, gray (10YR 5/1) sandy loam; common, coarse, distinct, yellowish-brown (10YR 5/8) mottles and common, medium, prominent, red (10R 4/8) mottles; weak, fine and medium, subangular blocky structure; friable; pale sandy loam material extending downward in coarse, flat, vertical cracks; thin patchy clay films on peds and in pores; common medium pockets of sandy clay loam; very strongly acid; gradual, smooth boundary.

B23t—55 to 65 inches, yellowish-brown (10YR 5/8) sandy loam; common, coarse, distinct, gray (10YR 6/1), and common, medium, prominent, red (2.5YR 4/8) mottles; weak, fine and medium, subangular blocky structure; friable; pale sandy loam material extending downward in coarse, flat, vertical cracks; patchy clay films in holes and on peds; common medium pockets of sandy clay loam; very strongly acid; gradual, smooth boundary.

B24t—65 to 72 inches, yellowish-brown (10YR 5/8) loam; common, coarse, distinct, gray (10YR 5/1) mottles and common, fine, prominent, red (10R 4/6) mottles; weak, fine and medium, subangular blocky structure; friable; pale loam material extending downward in coarse flat, vertical cracks; thin patchy clay films on peds and in holes; common medium pockets of clay loam material; very strongly acid.

The A1 horizon is very dark gray or very dark grayish brown, and mottles in shades of brown and gray are in some places. The A2 horizon is dark gray, dark grayish brown or gray mottled with shades of brown and red. The texture is sandy loam, very fine sandy loam, or loam. The upper part of the B2 horizon is dark gray, gray, or light brownish gray mottled in shades of brown or red. Its texture is fine sandy loam, loam, or sandy loam that is 5 to 16 percent clay in the upper 20 inches. The lower part of the B2 horizon is similar in color to the upper part of the B horizon or has matrix colors of yellowish brown, light olive brown, or light yellowish brown and is mottled in shades of brown, red, or gray or in shades of gray, brown, or red. Reaction of the soil is strongly acid or very strongly acid.

Smithton soils are associated with Escambia, Ponzer, Saucier, and Susquehanna soils. They are more poorly drained than Escambia soils and also differ in containing less than 5 percent plinthite in the Bt horizon. They lack the thick, organic surface layer of the Ponzer soils. They are grayer and coarser textured in the Bt horizon than the Saucier soils. They differ from Susquehanna soils in having a Bt horizon that is coarser textured and that is grayer in the upper part.

Smithton fine sandy loam (St).—This is a poorly drained soil in depressions, wet flats, and drainageways. Slopes are 0 to 2 percent.

Included in mapping are small areas of Escambia, Ponzer, and Saucier soils.

The soil is strongly acid or very strongly acid. Permeability is moderate to moderately slow, and available water capacity is medium. Runoff is slow or very slow.

More than half the acreage is pine woodland. The rest is idle, in pasture, or in urban areas. This soil is suited to pasture plants and lawn grasses. Excessive wetness is a hazard. For intensive use, the soil needs surface drainage to reduce the wetness. Capability unit IIIw–2; woodland group 2w9.

St. Lucie Series

The St. Lucie series consists of excessively drained soils that formed in sandy material on Deer, Ship, and Cat Islands.

In a representative profile the surface layer is gray fine sand about 15 inches thick. The underlying material is light-gray fine sand to a depth of 25 inches and white fine sand to a depth of 60 inches.

Representative profile of St. Lucie sand, 1 mile east of pier at old quarantine station on Ship Island, and 550 feet north of the water's edge at 30°14′ north latitude and 88°53′ west longitude, T. 9 S., R. 9 W.

O1—1 inch to 0, layer of partially decomposed leaf mold mixed with common sand grains.

A1—0 to 15 inches, gray (10YR 6/1) fine sand; single grained; loose; common fine roots; neutral; gradual, smooth boundary.

C1—15 to 25 inches, light-gray (10YR 7/1) fine sand; single grained; loose; few fine roots; uncoated sand grains; neutral; gradual, smooth boundary.

C2—25 to 60 inches, white (10YR 8/1) fine sand; single grained; loose; few fine roots; sand grains uncoated; neutral.

Texture is sand or fine sand throughout. Where undisturbed, the A horizon is a mixture of organic matter and white or light-gray sand grains. The composite colors of the A horizon range from gray to white. Reaction of the soil is slightly acid or neutral.

St. Lucie soils are associated with Handsboro, Hyde, and Ponzer soils. They are sandy light-colored soils on offshore islands, and Handsboro soils formed in dark, well-decomposed, fibrous organic material adjoining salt or brackish water. The excessively drained St. Lucie soils are coarser textured than the very poorly drained Hyde and Ponzer soils.

St. Lucie sand (Su).—This is an excessively drained soil on low ridges on Deer, Cat, and Ship Islands. It has the profile described as representative of the series. Slopes are 0 to 5 percent. Included in mapping are small areas of Coastal beach, Handsboro association, and St. Lucie sand, hummocky.

This soil is neutral to slightly acid. Permeability is very rapid, and available water capacity is low. There is little or no surface runoff. Soil blowing is a hazard where the soil is left bare and unprotected.

Most of the acreage is woodland that has a mature stand of scrubby hardwoods and pines. The pine trees are mostly short and scrubby, but in a few areas they are tall and well formed. This soil is best suited to pine trees and recreational uses. Capability unit VIIs–2; woodland group 5s3.

St. Lucie sand, hummocky (Sv).—This mapping unit consists of hillocks or low ridges of sand that drifted and piled up by wind action. It is on Deer, Ship, and Cat Islands. The soil shifts continually and does not remain in place long enough for horizons to form. It supports only a few scattered scrubby trees, shrubs, and grasses. Average slope of the dunes is 5 percent.

The surface layer is white fine sand about 9 inches thick. Below this is coarsely stratified white, light-gray, and gray fine sand that has fine, black material interspersed between the clean sand grains. Capability unit VIIIs–1; no woodland suitability rating given.

Sulfaquepts

The Sulfaquepts consist of soils that formed in areas of hydraulic fill. They are along the marshes, beaches, and the Harrison County Industrial Waterway.

In sequence from the top of a representative profile is about 6 inches of pale-brown sand that is stratified with brownish and yellowish sands and that contains common, coarse, very dark gray clay balls which have thin coats of sulfur; 7 inches of gray sand that is stratified with yellowish sands and that contains common, coarse, very dark gray clay balls which have thin coats of sulfur; 20 inches of stratified gray sand that contains few medium clay balls; and below this, to a depth of 50 inches, stratified gray sand.

Representative profile of Sulfaquepts, in Biloxi, one-quarter mile east of Oak Street and 500 feet south, SE¼ SW¼ sec. 26, T. 7 S., R. 9 W.

C1—0 to 6 inches, pale-brown (10YR 6/3) sand; dark grayish-brown (2.5Y 4/2) and brownish-yellow (10YR 6/6) strata; massive; loose; common, coarse, very dark gray (5Y 3/1) clay balls; clay balls have thin yellow (2.5Y 7/6) coatings of sulfur; very strongly acid.

C2—6 to 13 inches, gray (10YR 6/1) sand; coarse and fine brownish-yellow (10YR 6/8) and yellow (5Y 7/6) strata; massive; very friable; common, coarse, very dark gray (5Y 3/1) clay balls; clay balls have thin yellow (2.5Y 7/6) coatings of sulfur; medium acid.

C3—13 to 33 inches, gray (10YR 6/1) stratified sand; massive; very friable; few medium clay balls; water table at a depth of 18 inches; moderately alkaline.

C4—33 to 50 inches, gray (10YR 5/1) stratified sand; massive; very friable; strongly alkaline.

The C1 horizon is pale brown, very pale brown, brown, yellowish brown, and light yellowish brown and has common or many, fine and coarse strata that are colored in shades of gray, olive brown, and yellow, or is finely and coarsely stratified and has colors in shades of gray, olive, brown, and yellow. The C2, C3, and C4 horizons are gray or olive gray and have common or many, fine and coarse strata and are colored in shades of gray, yellow, and brown; or the horizon is finely and coarsely stratified and has colors in shades of yellow, brown, and gray. Texture is dominantly sand, but includes loamy sand, fine sandy loam, silt loam, clay loam, silty clay, and clay. Coarse, yellow-coated clay balls range from many to none throughout the soil. Common, fine and medium quartz gravel is on the surface in places. Reaction ranges from extremely acid in the surface layer to strongly alkaline in the lower part. Alkaline samples, taken below the level of the water table, become extremely acid after they air dry several months.

Sulfaquepts (Sw).—This mapping unit is made up of soils formed in areas of fill materials along beaches, marshes, and the Harrison County Industrial Waterway.

These soils were accumulated by diking, then filling the dikes with sand, silt, and mud by pumping and using brackish water or sea water. The materials in these areas, although dominantly sands, are variable in texture, ranging from sand to silty clay and clay. The surface layer is extremely acid, but reaction is variable in the subsoil. These soils contain sulfur. A few months after an area has been filled, patches of yellow elemental sulfur are on the surface. The available water capacity generally is low.

Included in this mapping unit are small areas of fills that are used for building sites and lawns. After the soil material is dry, it is leveled and used for industrial and residential sites.

These soils are capable of growing only a few plants. In their present state, they are unsuited to lawns. Where a

lawn is to be developed, the management required is so severe and plant adaption so limited that the solution in most cases is to add oyster shells or limestone and then plate the area with suitable topsoil material. Capability unit VIIIs–2; no woodland suitability rating given.

Susquehanna Series

The Susquehanna series consists of somewhat poorly drained soils that formed in clayey materials. Slopes are 2 to 12 percent.

In a representative profile the surface layer is dark-brown fine sandy loam about 5 inches thick. The subsoil is mainly clay to a depth of 60 inches. The upper 9 inches is yellowish red mottled with shades of gray and red, the next 25 inches is mottled with shades of gray, red, and brown, and the lower part is gray mottled with shades of red and brown.

Representative profile of Susquehanna fine sandy loam, 2 to 5 percent slopes, from an area of Saucier-Susquehanna complex, 2 miles west of U.S. Highway 49, along State Highway 53, then 1 mile north on gravel road, and 100 feet west of roadway, SE¼SE¼ sec. 13, T. 6 S., R. 12 W.

A1—0 to 5 inches, dark-brown (10YR 4/3) fine sandy loam; weak, fine, granular structure; friable; common fine roots; many medium sesquioxide nodules; very strongly acid; clear, smooth boundary.

B1—5 to 8 inches, strong-brown (7.5YR 5/6) fine sandy loam, weak, fine, granular structure; friable; few fine roots; many medium sesquioxide nodules; very strongly acid; gradual, smooth boundary.

B21t—8 to 17 inches, yellowish-red (5YR 4/6) clay; common, fine, distinct, light brownish-gray and red mottles; moderate, medium and coarse, angular blocky structure; firm, plastic and sticky; few fine roots; clay films or pressure faces on ped faces; very strongly acid; clear, smooth boundary.

B22t—17 to 26 inches, mottled gray (10YR 6/1), red (2.5YR 4/6), and yellowish-brown (10YR 5/4) clay; strong, medium and coarse, angular blocky structure; firm, plastic and sticky; few slickensides that do not intersect; few fine roots; clay films or pressure faces on ped faces; very strongly acid; gradual, smooth boundary.

B23t—26 to 42 inches, mottled gray (10YR 6/1), red (2.5YR 4/8), yellowish-brown (10YR 5/8), and dark-red (10R 3/6) clay; moderate, medium and coarse, angular blocky structure; firm, plastic and sticky; common medium slickensides that do not intersect; few fine roots; clay films or pressure faces on peds; very strongly acid; gradual, wavy boundary.

B24tg—42 to 60 inches, gray (5Y 6/1) clay; common, coarse, prominent, weak-red (10YR 4/4) mottles, common, medium, distinct, strong-brown (7.5YR 5/8) mottles, and few, medium, prominent, dark-red (10R 3/6) mottles; coarse intersecting slickensides parting to strong, medium and coarse, angular blocky structure; firm, plastic and sticky; few fine roots; pressure faces on ped faces and grooves on ped faces; very strongly acid.

The A1 horizon is very dark gray, dark gray, dark grayish brown, very dark grayish brown, or dark brown. The Ap and A2 horizons are dark grayish brown, dark brown, dark yellowish brown, or brown. The B1 horizon is strong brown or yellowish red. The upper part of the Bt horizon is red or yellowish red. Few to many grayish mottles are in the upper 10 inches, or the horizon is mottled in shades of gray, red, and yellow. The lower part of the Bt horizon has gray matrix colors or is mottled in shades of gray, red, brown, and yellow. Texture of the Bt horizon is clay or clay loam. Reaction of the soil is strongly acid or very strongly acid.

Susquehanna soils are associated with Ocilla, Saucier, and Smithton soils. They are more gray and fine textured in the upper part of the B horizon than Saucier soils. They differ from Smithton soils in having a finer texture throughout the B horizon and in being redder in the upper part of the B horizon. They are finer textured throughout than Ocilla soils.

Use and Management of the Soils

This section describes management of the soils of Harrison County for tilled crops and tame pasture, and then for wildlife, woodland, and engineering purposes. The use of soils in town and country planning is also discussed.

Use of the Soils for Crops and Tame Pasture

This section describes general practices of soil management and explains the capability classification Also in this section is a table that gives estimated yields of important crops and pasture grasses under a high level of management.

Suitability of the soils for plants is rated in a table.

General management practices [2]

CULTIVATED CROPS. Cultivation of the soils causes leaching out of plant food nutrients and increases the hazard of erosion. Therefore, suitable cropping systems are needed to maintain organic-matter content, to help control erosion, and to increase the level of fertility.

Close-growing or sod crops and annual cover crops grown in sequence with row crops help to maintain organic-matter content, control erosion, and build up fertility of soils. The length of time that cover is needed, in proportion to the length of time that a row crop is grown, depends on the type of soil, the slope, and the degree of the erosion hazard.

Fertilizers should be applied on all cropland to increase yields. Crop residue should be shredded following harvest and left on the surface or disked into the surface layer of soils that flood. The need for fertilizer varies with the soils and with the type of crop. Soil tests should be used to help determine the correct amount and type of fertilizer to add. Recommendations can be obtained from the local Extension Service office and the Mississippi Agricultural Experiment Station.

Some of the soils in the county have limitations caused by surface and internal drainage. These soils need drainage mains and laterals, along with surface field drains that lead into them. Diversions are needed to protect the bottom lands from excessive runoff water. Contour farming is needed on the gently sloping fields to help control erosion and conserve moisture.

PASTURE. Good, well-managed sods of grasses and legumes help prevent the soil from eroding, provide forage and feed for livestock, and build up the organic-matter content of the soils.

The soils of Harrison County are suited to a wide variety of grasses and legumes. Some soils are better suited than others. The local SCS office can suggest suitable plants and combination of plants for individual soils. The

[2] H. S. SAUCIER, agronomist, Soil Conservation Service, assisted in preparation of this section.

type of livestock enterprise and the individual needs of the farmer should be considered also.

Perennial grasses that are widely adapted to the soils are common bermudagrass, Coastal bermudagrass, bahiagrass, and tall fescue. Legumes that are well adapted are white clover, crimson clover, arrowleaf clover, and annual lespedeza.

Regular additions of fertilizer and lime are advantageous to all pastures. The amount, type, and frequency of application should be determined by a soil test.

Grasses and legumes grow better and produce a greater amount of forage when overgrazing is prevented by proper stocking and rotation grazing.

Estimated yields

Yields of principal crops grown in the county under a high level of management are estimated in table 2. Estimates are based on yields obtained from long-term experiments; yields harvested on farms that cooperated in soil management studies; and yields measured in field trials and demonstration plots. Soils for which data were lacking from these sources were compared with similar soils. These estimates are for nonirrigated areas. Data reflect the effects of average rainfall, temperature, and other climatic factors that influence yields.

To obtain yields similar to those in table 2 the following practices are recommended:

1. Fertilizing in accordance with the needs indicated by soil tests and recommendations of the Mississippi Agricultural Experiment Station.
2. Use of crop varieties and hybrids that are high yielding and suited to the area.
3. Adequate preparation of the seedbed.
4. Planting or seeding by suitable methods at recommended seeding rates and planting dates.
5. Inoculation of legumes.
6. Shallow cultivation of row crops.
7. Control of weeds, insects, and disease.
8. Use of soil-conserving cropping systems.
9. Control of drainage, where needed, by sodding waterways, cultivating on the contour, terracing, contour stripcropping, and using diversion terraces.
10. Protecting pastures from overgrazing.

TABLE 2.—*Estimated average yields per acre of principal crops on arable soils under high level management*

[Absence of figure indicates that the soil is not suited to the crop or the crop is not ordinarily grown on the soil]

Soil	Soybeans	Corn	Pasture		Hay	
			Bahiagrass	Coastal bermudagrass	Bahiagrass	Coastal bermudagrass
	Bushels	*Bushels*	*A.U.M.*[1]	*A.U.M.*[1]	*Tons*	*Tons*
Atmore silt loam			6.5	7.0	3.0	3.5
Escambia silt loam	40	100	9.0	10.0	4.5	5.0
Eustis loamy sand, 0 to 5 percent slopes			5.5	6.0	2.25	3.0
Eustis and Poarch soils, 8 to 17 percent slopes:						
Eustis soils			4.5	5.0	2.0	3.0
Poarch soils			8.0	10.0	4.0	5.0
Harleston fine sandy loam, 0 to 2 percent slopes	40	100	10.0	11.0	5.0	5.5
Harleston fine sandy loam, 2 to 5 percent slopes	35	95	9.5	10.0	4.5	5.5
Hyde silt loam			9.5	9.5	5.0	5.0
Lakeland fine sand			5.0	5.0	2.5	2.5
Latonia loamy sand			9.0	10.0	4.5	5.0
McLaurin fine sandy loam, 2 to 5 percent slopes	30	75	9.0	10.0	4.5	5.0
McLaurin fine sandy loam, 5 to 8 percent slopes	25	70	8.0	9.0	4.0	4.5
Nahunta silt loam			8.0	9.0	4.0	4.5
Ocilla loamy sand			8.0	8.5	4.0	4.5
Plummer loamy sand			5.0	6.0	2.5	3.0
Poarch fine sandy loam, 0 to 2 percent slopes	30	90	8.5	9.0	4.25	4.5
Poarch fine sandy loam, 2 to 5 percent slopes	30	80	8.5	9.0	4.25	4.5
Poarch fine sandy loam, 5 to 12 percent slopes	25	70	8.0	8.0	4.0	4.0
Ruston fine sandy loam, 0 to 2 percent slopes	30	70	10.0	10.0	5.0	5.0
Ruston fine sandy loam, 2 to 5 percent slopes	30	70	10.0	10.0	5.0	5.0
Ruston fine sandy loam, 5 to 8 percent slopes	25	55	9.5	9.5	5.0	5.0
Ruston fine sandy loam, 8 to 12 percent slopes			9.0	9.0	4.5	4.5
Saucier fine sandy loam, 2 to 5 percent slopes	25	75	8.5	10.0	4.0	5.0
Saucier fine sandy loam, 5 to 8 percent slopes	20	70	7.0	9.0	3.5	4.5
Saucier, Smithton, and Susquehanna soils, rolling:						
Saucier soils			7.0	9.0	4.0	5.0
Smithton soils			7.0		3.5	
Susquehanna soils			6.5	8.5	4.0	4.5
Saucier-Susquehanna complex, 2 to 5 percent slopes	15	55	8.0	9.0	4.5	5.0
Smithdale fine sandy loam, 12 to 17 percent slopes			7.0	8.0	3.5	4.0
Smithton fine sandy loam			7.0	7.0	3.5	3.5

[1] Animal-unit-months is the number of months during a year that 1 acre will provide grazing for one animal, or 1,000 pounds of live weight.

Suitability of the soils for specified horticultural plants

Suitability of the undisturbed soil for growing selected horticultural plants is rated in table 3. To grow selected plants successfully, plant only recommended kinds and varieties, control diseases and insects, and follow fertilizer recommendations.

Three classes of soil condition—good, fair, and poor—are used. They are defined as follows:

Good. A soil in good condition has only slight limitations for growing climatically adapted species and has slight management problems.

Fair. A soil in fair condition has moderate limitations for growing climatically adapted species.

Poor. A soil in poor condition has severe limitations for growing climatically adapted species, or is severely limited in the kinds of plants that can be grown, or has severe management problems.

Capability grouping

Capability grouping shows, in a general way, the suitability of soils for most kinds of field crops. The soils are grouped according to their limitations when used for field crops, the risk of damage when they are used, and the way they respond to treatment. The grouping does not take into account major and generally expensive landforming that would change slope, depth, or other characteristics of the soils; does not take into consideration possible but unlikely major reclamation projects; and does not apply to rice, cranberries, horticultural crops, or other crops requiring special management.

Those familiar with the capability classification can infer from it much about the behavior of soils when used for other purposes, but this classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for range, for forest trees, or for engineering.

In the capability system, the kinds of soil are grouped at three levels: the capability class, the subclass, and the unit. These levels are described in the following paragraphs.

CAPABILITY CLASSES, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. In class I are soils that have few limitations, the widest range of use, and the least risk of damage when they are used. The soils in the other classes have progressively greater natural limitations. In class VIII are soils and landforms so rough, shallow, or otherwise limited that they do not produce worthwhile yields of crops, forage, or wood products.

CAPABILITY SUBCLASSES are soil groups within one class; they are designated by adding a small letter, *e*, *w*, *s*, or *c*, to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is too cold or too dry.

In class I there are no subclasses, because the soils of this class have few limitations. Class V can contain, at the most, only the subclasses indicated by *w*, *s*, and *c*, because the soils in class V are subject to little or no erosion, though they have other limitations that restrict their use largely to pasture or range, woodland, wildlife, or recreation.

CAPABILITY UNITS are soil groups within the subclasses. The soils in one capability unit are enough alike to be suited to the same crops and pasture plants, to require similar management, and to have similar productivity and other responses to management. Thus, the capability unit is a convenient grouping for making many statements about management of soils. Capability units are generally designated by adding an Arabic numeral to the subclass symbol, for example, IIe-1. Thus, in one symbol, the Roman numeral designates the capability class, or degree of limitation; the small letter indicates the subclass, or kind of limitation, as defined in the foregoing paragraph; and the Arabic numeral specifically identifies the capability unit within each subclass.

The soils in Harrison County are represented in all eight capability classes and in 26 capability units. The soils in each unit have about the same limitations, are subject to similar risks of damage, need about the same kind of management, and respond to management in about the same way. Management of the soils is explained in the description of the mapping units in "Descriptions of the Soils." To determine the names of the soils in a capability unit refer to the "Guide to Mapping Units" at the back of this survey.

The eight capability classes in the classification system and the subclasses and units that are in Harrison County are described as follows:

Class I soils have few limitations that restrict their use (no subclasses).

Unit I soils are well-drained soils and have slopes of 0 to 2 percent.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Subclass IIe soils are subject to erosion if unprotected.

Unit IIe-1 soils are moderately well drained, are loamy, and have slopes of 2 to 5 percent.

Unit IIe-2 soils are well drained, are loamy, and have slopes of 0 to 5 percent.

Subclass IIw soils are moderately limited by excessive wetness.

Unit IIw-1 soils are moderately well drained, are loamy, and have slopes of 0 to 2 percent.

Unit IIw-2 soils are somewhat poorly drained and have slopes of 0 to 2 percent.

Class III soils have severe limitations that reduce the choice of plants, require special conservation practices, or both.

Subclass IIIe soils are subject to severe erosion if unprotected.

Unit IIIe-1 soils are well drained and moderately well drained, are loamy, and have slopes of 5 to 8 percent.

Subclass IIIw soils are severely limited by excessive wetness.

Unit IIIw-1 soils are somewhat poorly drained and have a thick, sandy surface layer and slopes of 0 to 2 percent.

TABLE 3.—*Suitability of soils*

[Numeral 1 indicates a rating

Soil and map symbol	Grasses			Vegetables						
	Bermuda	St. Augustine	Centipede	Tomatoes	Watermelons	Corn	Potatoes	Cabbage	Okra	Green beans
Atmore: At	2	3	3	3	3	3	3	3	3	3
Coastal beach: Cb. Variable and unsuitable.										
Escambia Es	2	2	2	3	3	3	2	2	2	2
Eustis: EtB, EuE. For Poarch part of EuE, see Poarh series.	2	2	2	3	2	3	3	2	3	3
Handsboro: Ha. Variable and unsuitable.										
Harleston: HlA, HlB	1	1	1	2	2	1	1	1	1	1
Hyde: Hy	2	3	3	3	3	3	3	3	3	3
Jena [1]. Mapped only with Nugent soils.	1	1	1	1	1	1	2	1	1	2
Lakeland: Lr	2	2	2	3	2	3	3	3	3	3
Latonia: Lt	1	1	1	2	2	2	3	2	2	2
McLaurin: MlB, MlC	1	1	1	1	1	1	2	1	1	2
Nahunta: Nh	2	2	2	3	3	3	2	1	1	1
Nugent: Nu [1]. For Jena part of Nu see Jena series.	2	2	2	2	2	2	3	2	2	2
Ocilla: Oc	2	1	1	3	3	2	2	2	1	1
Plummer: Pm	2	3	3	3	3	3	3	3	3	3
Poarch: PoA, PoB, PoC	1	1	1	1	1	1	2	1	1	2
Ponzer: Ps. For Smithton part of Ps, see Smithton series.	2	3	3	3	3	3	3	3	3	3
Ruston: RuA, RuB, RuC, RuD	1	1	1	1	1	1	2	1	1	2
Saucier: SfB, SfC, ShC, SnB. For Smithton part of ShC, see Smithton series. For Susquehanna part of ShC and SnB, see Susquehanna series.	1	1	1	2	2	1	2	1	1	2
Smithdale: SsE	1	1	1	1	1	1	2	1	1	2
Smithton: St	2	3	3	3	3	3	3	3	3	3
St. Lucie: Su, Sv	3	3	3	3	3	3	3	3	3	3
Sulfaquepts: Sw. Variable and unsuitable.										
Susquehanna. Mapped only with Saucier and Smithton soils.	2	2	2	3	3	3	3	3	2	3

[1] Ratings apply to areas not subject to flooding.

for specified horticultural plants

of good; 2 fair, and 3, poor]

Fruits and nuts								Ornamentals							
Black-berries	Rabbit-eye blue-berries	Peaches	Pears	Pecans	Plums	Japa-nese per-simmon	Mus-cadine grape	Holly	Bush honey-suckle	Pyra-cantha	Yaup-on	Azalea	Ca-melia	Rose	Ligus-trum
3	2	3	3	3	3	2	3	2	3	3	2	2	3	3	2
2	2	3	3	3	3	2	2	2	2	2	2	2	2	3	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2
1	1	2	1	1	1	1	1	1	1	1	1	1	1	2	1
3	2	3	3	3	3	2	3	2	3	3	2	3	3	3	3
1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
1	2	2	2	2	2	2	2	2	3	2	2	2	2	3	1
1	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2
1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
2	1	3	3	3	3	2	1	2	3	2	2	2	2	2	1
1	2	2	2	2	2	2	1	2	2	2	2	2	2	3	2
1	1	3	2	2	2	2	1	1	2	1	2	1	1	2	1
3	2	3	3	3	3	3	3	3	3	3	2	3	3	3	2
1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
3	2	3	3	3	3	3	3	2	3	3	3	3	3	3	3
1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
1	1	2	1	1	1	1	1	1	1	1	1	2	1	2	1
1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
3	2	3	3	3	3	2	3	2	3	3	2	2	3	3	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
3	3	3	3	3	2	2	2	2	3	2	2	2	2	2	2

Unit IIIw–2 soils are poorly drained, are loamy, and have slopes of 0 to 2 percent.

Subclass IIIs soils are severely limited by low available water capacity.

Unit IIIs–1 soils are somewhat excessively drained, are sandy, and have slopes of 0 to 5 percent.

Class IV soils have very severe limitations that reduce the choice of plants, require very careful management, or both.

Subclass IVe soils are subject to severe erosion if cultivated and unprotected.

Unit IVe–1 soils are well drained and moderately well drained, are loamy, and have slopes of 5 to 12 percent.

Unit IVe–2 soils are moderately well drained and somewhat poorly drained, are loamy, and have a clayey subsoil and slopes of 2 to 5 percent.

Subclass IVw soils are very severely limited for cultivation by excessive wetness.

Unit IVw–1 soils are poorly drained and very poorly drained, are loamy, and have slopes of 0 to 2 percent that remain wet for a long period.

Unit IVw–2 soils are poorly drained, are loamy, and have a thick sandy surface layer and slopes of 0 to 2 percent.

Subclass IVs soils are very severely limited by low available water capacity or other features.

Unit IVs–1 soils are excessively drained, are sandy, and have slopes of 0 to 5 percent.

Class V soils are subject to little or no erosion but have other limitations, impractical to remove, that limit their use largely to pasture or range, woodland, or wildlife.

Subclass Vw soils are very severely limited by frequency of flooding or high water table and are generally unsuited to cultivation.

Unit Vw–1 soils are excessively drained and well drained, sandy and loamy, and on flood plains, and have slopes of 0 to 2 percent.

Unite Vw–2 soils are poorly drained, are loamy, and on flood plains, and have slopes of 0 to 2 percent.

Class VI soils have severe limitations that make them generally unsuited to cultivation and limit their use largely to pasture or range, woodland, or wildlife.

Subclass VIe soils are severely limited chiefly by risk of erosion, if protective cover is not maintained.

Unit VIe–1 soils are somewhat poorly drained, are sloping, and have a clayey subsoil.

Unit VIe–2 soils are well drained, are loamy, and have slopes of 12 to 17 percent.

Class VII soils have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland, or wildlife.

Subclass VIIw soils are very severely limited by excessive wetness.

Unit VIIw–1 soils are very poorly drained, are on flood plains, and have a thick, mucky surface layer.

Subclass VIIs soils are very severely limited by low available water capacity.

Unit VIIs–1 soils are somewhat excessively drained, are loamy sand, and have slopes of 8 to 17 percent.

Unit VIIs–2 soils are excessively drained, are fine sand or sand, and subject to blowing if unprotected.

Class VIII soils and landforms have limitations that preclude their use for commercial crop production and restrict their use to recreation, wildlife, or water supply, or to use for esthetic purposes.

Subclass VIIIw soils are extremely limited by excessive wetness and flooding with sea water.

Unit VIIIw–1 soils are very poorly drained, nearly level, and continuously flooded, and formed in highly decomposed herbaceous plants.

Subclass VIIIs soils are extremely limited by actively shifting winds, by partial flooding daily by tide water, or by acidity in the surface layer, and are capable of supporting little or no vegetation.

Unit VIIIs–1 soils are white sand adjoining the Gulf or sand drifted and piled by the wind into hillocks and low ridges.

Unit VIIIs–2 soils have an extremely acid surface layer and variable reaction in the subsoil.

Use of the Soils for Wildlife [3]

Animal life is dependent directly or indirectly upon plant life. In order to relate wild animals to a soil, we must determine that soil's ability to produce the plant life necessary to support the animal. Each animal has certain habitat requirements. Wildlife in any given area is influenced by land use, kind and amount of vegetation, and the amount and distribution of water areas, both brackish and fresh. All of these conditions are influenced by characteristics of the soil. Wildlife habitat can be improved by planting choice plants, managing existing vegetation, and locating water impoundments where water is scarce.

In table 4 the soils of Harrison County are rated according to their ability to produce suitable habitat for the different classes of wildlife. This table also shows the suitability of the soils for the important elements of wildlife habitat.

The elements of habitat shown in table 4 are defined in the following paragraphs.

Grasses and legumes are perennial grasses and herbaceous legumes that are established by planting and that furnish wildlife food and cover. Examples are fescue, bahiagrass, ryegrass, panicgrass, clovers, and annual and bush lespedezas.

Grain and seed crops are seed-producing annuals, such as corn, sorghum, millet, wheat, oats, soybeans, and sunflowers.

Wild herbaceous plants are native or introduced perennial grasses and forbs (weeds) that provide food and cover principally for upland wildlife, and that are established mainly through natural process. Examples are beggarweed, perennial lespedeza, wild bean, and pokeberry.

Wetland food and cover plants are annual and perennial, domestic or wild, herbaceous plants that grow on moist or wet sites. These plants furnish food and cover for wetland forms of wildlife. Examples are rice, smart-

[3] EDWARD G. SULLIVAN, biologist, Soil Conservation Service, helped prepare this section.

weed, wild millet, spike rush, rushes, sedges, burreed, cattails, pond weeds, water lilies, and tearthumb.

Hardwood trees and shrubs are nonconiferous trees, shrubs, and woody vines that produce fruits, nuts, buds, seeds, catkins, twigs, and foliage (browse) used extensively as food by wildlife. The plants are commonly established through natural processes, but also may be planted. Examples are oak, beech, cherry, dogwood, viburnum, maple, wild grape, honeysuckle, blackberry, greenbrier, and elaeagnus.

Shallow water developments are impoundments or excavations for control of water that are generally not more than 6 feet in depth. Examples are shallow impoundments and water-level control structures on flood plains.

Soils are rated in greater detail for impounded and excavated ponds in the engineering section.

The three kinds of wildlife rated in table 4 are as follows:

Openland wildlife consists of farm game such as bobwhites, doves, cottontail rabbits, meadowlarks, and lark sparrows.

Woodland wildlife consists of forest game such as deer, turkey, and squirrel.

Wetland wildlife consists of waterfowl, such as wood ducks, mallards, Canada geese, rails, shorebirds, coots, cranes, and snipe. It also consists of muskrat, mink, nutria, otter, raccoon, alligators, turtles, and crawfish.

These ratings refer only to the suitability of the soil, and do not take into account the present use of the soil or the distribution of wildlife or human populations. The overall suitability of individual sites must be determined by an onsite inspection of the area.

Use of the Soils for Woodland [4]

Woodland covers 76 percent of Harrison County, or approximately 285,600 acres. This woodland is of five dominant forest types. The longleaf-slash pine type is the largest and occupies 183,600 acres; 20,400 acres is loblolly-shortleaf pine forest; 45,900 acres is oak-pine forest; 10,200 acres is oak-hickory forest; and 25,500 acres is oak-gum-cypress forest. All five southern pine species are well adapted in the county. Their variation in occurrence is due to both the various soils that make up the county and past treatment of the soil and forest resources by man (*4*).

Farmers and miscellaneous private owners control 48 percent of the woodland, industry owners 26 percent, national forests make up 21 percent, and other public owners only 5 percent.

A suitable secondary use for most of the woodland is grazing. The grasses, legumes, and forbs and many of the woody plants in the understory can be utilized for forage. Proper stocking of grazing animals to the amount of forage produced is essential to prevent damage to desirable tree species.

This section gives information about both the production of wood crops and the production of forage in woodland.

Production of wood crops

Tables 5 gives landowners and operators of woodlands quick summary information. This information is based on plot studies, both published and unpublished, plus experience and observation of technicians who work with tree crops in the area (*7*).

The soils of Harrison County have been assigned to 13 woodland groups. Each group consists of soils that are about the same in suitability for wood crops, potential productivity, and management requirements. These factors depend on such soil characateristics as depth, color, drainage, degree of erosion, slope, and wetness. To learn the woodland group in which a particular soil has been placed, refer to the "Guide to Mapping Units" at the back of this survey.

Potential productivity of wood crops is given as a range of site index by species. Specific data have been collected on one or more soils in the group. Site index is the average height, in feet, of dominant trees in a stand at a specified age. The age of rating is 30 for cottonwood, 35 for sycamore, and 50 for all other trees.

Major hazards and limitations are the summary of soil-related factors that present problems in the management of woodlands (*6*).

Preferred species to be favored in existing stands are listed along with the species to be favored in establishing a stand by planting, direct seeding, or natural seeding. No attempt was made to list all species. Species were listed on the basis of suitability, growth, and quality of trees and value and marketability of the products obtained from each.

A woodland group is made up of soils that are capable of producing similar kinds of wood crops, that need similar management to produce these crops, and that have about the same potential productivity. The ordination system and the group symbols are explained in the following paragraphs.

The first element of the group symbol indicates the woodland suitability class. It expresses site quality by an Arabic numeral ranging from 1 to 5. Class 1 indicates highest potential productivity, and then class 2, 3, 4, and 5 in sequence. Suitability class is based on the average site index of one or more indicator forest types, or tree species.

The second element in the symbol indicates the subclass. It expresses selected soil properties that cause moderate to severe hazards or limitations in woodland use or management, by one of the following lowercase letters:

Subclass x (*stoniness or rockiness*). Soils having restrictions or limitations for woodland use or management because of stones or rocks.

Subclass w (*excessive wetness*). Soils in which excessive water, either seasonally or year long, causes significant limitations for woodland use or management. These soils have restricted drainage, high water tables, or overflow hazards which adversely affect either stand development or management.

Subclass t (*toxic substances*). Soils that have, within the rooting zone, excessive alkalinity, acidity, sodium salts, or other toxic substances that limit or impede development of desirable tree species.

Subclass d (*restricted rooting depth*). Soils that are limited for use or management as woodland because of rooting depth. Soils shallow to hard rock, hardpan, or other layers that restrict roots are examples.

Subclass c (*clayey soils*). Soils that are limited for use or management as woodland because of the kind or amount of clay in the upper part of the soil profile.

[4] ROBERT L. GRIGSBY, forester, Soil Conservation Service, helped prepare this section.

TABLE 4.—*Suitability*

Soil series and map symbols	Elements of wildlife habitat		
	Grasses and legumes	Grain and seed crops	Wild herbaceous plants
Atmore: At	Poor	Poor	Fair
Coastal beach: Cb. Too variable to rate.			
Escambia: Es	Good	Good	Good
Eustis:			
EtB	Fair	Fair	Fair
EuE	Poor	Poor	Fair
For Poarch part, see Poarch series.			
Handsboro: Ha	Very poor	Very poor	Very poor
Harleston: HlA, HlB	Good	Good	Good
Hyde: Hy	Poor	Poor	Fair
Jena	Fair	Poor	Poor
Mapped only with Nugent series.			
Lakeland: Lr	Fair	Poor	Fair
Latonia: Lt	Good	Good	Good
McLaurin: MlB, MlC	Good	Good	Good
Nahunta: Nh	Fair	Fair	Good
Nugent: Nu	Fair	Poor	Fair
For Jena part, see Jena series.			
Ocilla: Oc	Fair	Fair	Good
Plummer: Pm	Poor	Very poor	Fair
Poarch:			
PoA, PoB	Good	Good	Good
PoC	Good	Fair	Good
Poarch part of EuE	Fair	Poor	Fair
Ponzer: Ps	Very poor	Very poor	Very poor
For Smithton part, see Smithton series.			
Ruston:			
RuA, RuB	Good	Good	Good
RuC, RuD	Good	Fair	Fair
Saucier:			
SfB, SnB	Good	Good	Good
For Susquehanna part of SnB, see Susquehanna series.			
SfC, ShC	Good	Fair	Good
For Smithton and Susquehanna parts of ShC, see those series.			
Smithdale: SsE	Poor	Poor	Good
Smithton: St	Fair	Poor	Fair
St. Lucie: Su, Sv	Poor	Very poor	Poor
Sulfaquepts: Sw	Poor	Poor	Poor
Susquehanna	Fair	Fair	Good
Mapped only with Saucier and Smithton soils.			

[1] Restocking needed after intense hurricanes.

of soils as wildlife habitat

Elements of wildlife habitat—Continued			Kinds of wildlife		
Wetland food and cover plants	Hardwood trees and shrubs	Shallow water developments	Openland	Woodland	Wetland
Good	Good	Good	Poor	Good	Good.
Fair	Fair	Fair	Good	Good	Fair.
Very poor	Fair	Very poor	Fair	Fair	Very poor.
Very poor	Poor	Very poor	Poor	Poor	Very poor.
Poor	Very poor	Very poor	Very poor	Very poor	Poor.
Poor	Good	Poor	Good	Good	Poor.
Good	Good	Good	Poor	Good	Good.
Very poor	Good	Poor	Fair	Fair	Poor.
Very poor	Poor	Very poor	Fair	Poor	Very poor.
Very poor	Fair	Very poor	Good	Fair	Very poor.
Very poor	Good	Very poor	Good	Good	Very poor.
Fair	Good	Fair	Fair	Good	Fair.
Very poor	Good	Poor	Fair	Fair	Very poor.
Very poor	Good	Fair	Fair	Good	Very poor.
Good	Good	Good	Very poor	Good	Good.
Very poor	Good	Poor	Good	Good	Poor.
Very poor	Good	Very poor	Good	Good	Very poor.
Very poor	Fair	Very poor	Fair	Fair	Very poor.
Fair	Very poor	Good	Very poor	Very poor	Good.
Very poor	Fair	Very poor	Good	Fair	Very poor.
Very poor	Fair	Very poor	Good	Fair	Very poor.
Very poor	Good	Very poor	Good	Good	Very poor.
Very poor	Good	Very poor	Good	Good	Very poor.
Very poor	Fair	Very poor	Poor	Fair	Very poor.
Good	Good	Good	Fair	Fair	Good.
Very poor	Poor	Very poor	Poor [1]	Poor [1]	Very poor.[1]
Poor	Very poor	Poor	Poor [2]	Poor [2]	Poor.[2]
Very poor	Fair	Very poor	Fair	Fair	Very poor.

[2] Most areas of Sulfaquepts are part of wildlife refuges.

TABLE 5.—*Wood*

Woodland group, descriptions of soils, and map symbols	Potential productivity		Major hazards and limitations
	Important wood crops	Estimated site index range	
Group 1o7: Very highly productive, well-drained loamy soils on flood plains. Permeability is moderate to moderately rapid. Available water capacity is medium. Nu (Jena part).	Loblolly pine Slash pine Sweetgum Yellow-poplar	95–105 94–105 78–115 85–115	No severe limitations. Site preparation generally lasts only 1 year. Natural regeneration is easily obtained if sufficient openings are made for sunlight to reach the surface. Subject to flooding in winter and spring.
Group 1w9: Very poorly drained loamy soils in depressions and drainageways. Permeability is moderately slow. Available water capacity is high. Hy.	Slash pine Loblolly pine Sweetgum	87–103 87–103 89–105	Erosion hazard is slight. Equipment restrictions and seedling mortality are severe.[1] Only areas where surface drainage is adequate are suited to tree plantings. Logging can be done during the dry season.
Group 2o1: Well-drained loamy soils on uplands. Slopes range from 0 to 17 percent. Permeability is moderately rapid to moderately slow. Available water capacity is medium to high. Lt, MIB, MIC, PoA, PoB, PoC, RuA, RuB, RuC, RuD, SsE.	Loblolly pine Slash pine Longleaf pine	86–95 86–95 65–75	Erosion hazard, equipment limitations, and seedling mortality are slight. Rate of understory woody stem development is moderate. Site preparation generally lasts 2 years. Soils on high upland ridges support bluejack oak, draft post oak, and turkey oak. Scalping before planting is beneficial.
Group 2w3: Poorly drained loamy soils that have a thick sandy surface layer, in depressions and drainageways. Permeability is rapid in the upper part of the soil and moderate in the lower part. Available water capacity is low. Pm.	Slash pine Loblolly pine	77–93 80–95	Erosion hazard is slight. Equipment restrictions and seedling mortality are severe.[1] Only areas where surface drainage is adequate are suited to tree plantings.
Group 2w8: Moderately well drained and somewhat poorly drained loamy soils on upland and stream terraces. Slopes range from 0 to 5 percent. Permeability is moderate to slow. Available water capacity is medium to high. Es, HIA, HIB, Nh.	Loblolly pine Slash pine Sweetgum Longleaf pine	86–95 86–95 79–95 60–70	Equipment restrictions are moderate. Erosion hazard and seedling mortality are slight. Understory plant development in pine tracts needs to be controlled. For hardwood production short rotations are well suited because of the variety of soft hardwoods and coppice type regeneration that can be easily achieved.
Group 2w9: Poorly drained loamy soils on wet flats and in drainageways. Permeability is moderate in upper part and slow in lower part. Available water capacity is medium to high. At, St.	Loblolly pine Slash pine Sweetgum	85–95 85–95 80–100	Erosion hazard is slight. Equipment restrictions and seedling mortality are severe.[1] Surface drainage is needed to achieve potential productivity. Slightly sloping areas where surface water does not stand can support pine. Understory development of brush needs to be controlled. Wet areas are well suited to soft hardwoods. Regeneration of hardwoods by coppice is easily achieved.
Group 2s8: Excessively drained sandy soils on flood plains. Permeability is moderately rapid. Available water capacity is low. Nu. For Jena part of Nu, refer to group 1o7.	Loblolly pine [4] Slash pine [4] Pine sweetgum [4]	86–95 86–95 75–100	Erosion hazard is slight. Equipment restriction and seedling mortality are moderate. Mainly because of the low water holding capacity of the surface layer, this soil is subject to flooding of short duration in winter and spring.

crops and forage

Preferred species—		Understory vegetation utilized as forage	
In existing stands	For planting	Principal plants (high value)	Estimated yields by canopy class
			Lb. air-dry forage/acre
Slash pine, loblolly pine, spruce pine, sweetgum, water oak, yellow-poplar, red oak, white oak, magnolia, sweetbay, tupelo, bald cypress.	Slash pine, loblolly pine, yellow-poplar, sycamore.	Pinehill bluestem, beaked panicum, longleaf uniola, lopsided indiangrass, native lespedeza.	Open canopy 1,800–2,200; sparse 800–2,000; medium 400–1,000; dense 0–500.
Slash pine, loblolly pine, swamp blackgum, sweetbay, southern sweetbay, sweetgum.	Slash pine, loblolly pine	Pinehill bluestem, beaked panicum, slender bluegrass, low panicum.	Open canopy 2,000–2,500; sparse 1,000–2,200; medium 600–1,200; dense 0–600.
Longleaf pine, loblolly pine, slash pine.	Loblolly pine, slash pine, longleaf pine.[2]	Pinehill bluestem, slender bluestem, indiangrass, native lespedeza, beaked panicum.	Open canopy 2,500–2,800; sparse 1,000–2,600; medium 500–1,000; dense 0–500.
Slash pine, loblolly pine, swamp blackgum, sweetbay.	Slash pine,[3] loblolly pine[3]	Pinehill bluestem, toothache grass, switchgrass, low panicum.	Open canopy 2,000–3,000; sparse 1,000–2,200; medium 700–1,200; dense 0–800.
Slash pine, loblolly pine, longleaf pine, sweetgum, swamp blackgum, sweetbay.	Loblolly pine, slash pine, sweetgum, longleaf pine.[2]	Pinehill bluestem, beaked panicum, slender bluestem, low panicums.	Open canopy 2,000–2,500; sparse 1,000–2,200; medium 600–1,200; dense 0–600.
Slash pine, loblolly pine, sweetgum, magnolia, ash, green tupelos, red oak, white oak.	Slash pine,[4] loblolly pine,[4] sweetgum.[4]	Pinehill bluestem, beaked panicum, slender bluestem, low panicums.	Open canopy 2,000–2,500; sparse 1,000–2,200; medium 600–1,200; dense 0–600.
Birch, river cherry, black hackberry, sugarberry, magnolia, sweetgum, yellow-poplar, slash pine, loblolly pine.	Sweetgum, slash pine, yellow-poplar, loblolly pine.	Pinehill bluestem, low panicums, beaked panicums, greenleaf, golden aster.	Open canopy 1,600–1,800; sparse 800–1,800; medium 400–800; dense 0–400.

TABLE 5.—*Wood*

Woodland group, descriptions of soils, and map symbols	Potential productivity		Major hazards and limitations
	Important wood crops	Estimated site index range	
Group 3o2: Somewhat poorly drained soils that have a thick sandy surface layer over loamy materials, on uplands. Permeability is moderate. Available water capacity is low to medium. Oc.	Slash pine Loblolly pine Longleaf pine	75–85 73–85 62–74	Erosion hazard is slight. Equipment limitation and seedling mortality are moderate. Understory invasion by brush is moderate to severe. Site preparation generally lasts only 1 year.
Group 3w2: Moderately well drained loamy upland soils. Slopes range from 2 to 12 percent. Permeability of upper part of subsoil is moderate, but of lower part it is slow. Available water capacity is high. SfB, SfC, ShC. For Smithton and Susquehanna parts of ShC, refer to groups 2w9 and 3c2.	Longleaf pine Loblolly pine Slash pine	55–65 76–85 76–87	Erosion hazard and seedling mortality are slight. Equipment limitation is moderate. Understory invasion of brush is moderate. Site preparation generally lasts 1 year. Logging roads should be crowned and drained for use the year round.
Group 3s2: Somewhat excessively drained upland sandy soils. Slopes range from 0 to 17 percent. Permeability is moderately rapid. Available water capacity is low. EtB, EuE (Eustis part). For Poarch part of EuE, refer to 2o1.	Loblolly pine Slash pine Longleaf pine	78–89 78–88 60–70	Erosion hazard is slight. Equipment restrictions and seedling mortality are moderate. Understory plant invasion is slight. Site preparation generally lasts 2 years. Logging in the wet season is less difficult and less costly. When planting seedlings, scalping to remove competing plants is beneficial.
Group 3c2: Somewhat poorly drained clayey soils on uplands. Slopes range from 2 to 12 percent. Permeability is very slow. Available water capacity is high. SnB.	Loblolly pine Slash pine Longleaf pine	75–89 75–89 60–68	Erosion hazard is slight to moderate. Equipment restrictions and seedling mortality are moderate. Logging roads should be crowned and drained.
Group 4w3: Very poorly drained soils that have thick mucky surface layers, on flood plains. Permeability is moderate. Available water capacity is high. Ps. For Smithton part, refer to 2w9.	Slash pine [4]	65–80	Erosion hazard is slight. Equipment restrictions and seedling mortality are severe.[1] Natural regeneration is easily obtained from seed and by coppice if openings are sufficient for direct sunlight to reach the soil surface.
Group 4s3: Excessively drained sandy soils. Slopes range from 0 to 5 percent. Permeability is rapid. Available water capacity is low. Lr.	Loblolly pine Slash pine Longleaf pine	69–81 67–81 56–66	Erosion hazard is slight. Equipment restrictions are moderate, and seedling mortality is severe due to low available water capacity. Logging can be done during the wet season. When planting, scalping is needed to remove competing species. Any plant competition reduces seedling survival in most years.
Group 5s3: Excessively drained soils that consist of fine sands or sands. Permeability is very rapid. Available water capacity is low. Su.	----------------	50	Soil blowing is a hazard. Equipment limitation and seedling mortality are severe. Better suited to recreational purposes than to commercial forest.

[1] Equipment restrictions and seedling mortality are moderate in areas where surface drainage is adequate.
[2] Direct seeding of longleaf pine is desirable.

crops and forage—Continued

Preferred species—		Understory vegetation utilized as forage	
In existing stands	For planting	Principal plants (high value)	Estimated yields by canopy class
Slash pine, loblolly pine, longleaf pine.	Slash pine, loblolly pine	Pinehill bluestem, slender bluestem, indiangrass, native lespedeza, beaked panicum.	Open canopy 2,000–3,000; sparse 1,000–2,100; medium 700–1,200; dense 0–800.
Longleaf pine, loblolly pine, slash pine.	Loblolly pine, slash pine	Pinehill bluestem, slender bluestem, indiangrass, native lespedeza, beaked panicum.	Open canopy 2,500–2,800; sparse 1,000–2,600; medium 500–1,000; dense 0–500.
Longleaf pine, loblolly pine, slash pine.	Longleaf pine,[2] loblolly pine, slash pine.	Pinehill bluestem, slender bluestem, pineywoods dropseed, low panicums.	Open canopy 1,200–1,600; sparse 800–1,400; medium 300–800; dense 0–400.
Loblolly pine, slash pine, longleaf pine.	Loblolly pine, slash pine,[1] longleaf pine.[2]	Pinehill bluestem, longleaf uniola, tickclover, lopsided indiangrass, native lespedeza, low panicums.	Open canopy 1,800–2,200; sparse 800–2,000; medium 400–1,000; dense 0–500.
Slash pine, southern sweetbay, swamp blackgum, pond cypress.	Slash pine [3]	No grazing recommended	No grazing recommended.
Loblolly pine, slash pine, longleaf pine.	Loblolly pine, slash pine	Pinehill bluestem, slender bluestem, pineywood dropseed, low panicums.	Open canopy 1,200–1,600; sparse 800–1,400; medium 300–800; dense 0–400.
Slash pine	Sand pine	No grazing recommended	No grazing recommended.

[3] Tree planting is feasible only in areas where surface drainage is adequate.
[4] Limited data plus single stem measurements, detailed species observations.

Subclass s (*sandy soils*). Sandy soils that have little or no textural B horizon and have moderate to severe limitations for use or management as woodland. On these soils use of equipment is limited, available water capacity is low, and available plant nutrients are low.

Subclass f (*fragmental or skeletal soils*). Soils, including flaggy soils, that are limited for use or management as woodland because the profile contains large amounts of coarse fragments more than 2 millimeters and less than 10 inches in diameter.

Subclass r (*relief or slope steepness*). Soils that are limited for use or management as woodland only because of steepness of slope.

Subclass o (*slight or no limitations*). Soils that have no significant restrictions or limitations for woodland use or management. Some soils may have more than one set of subclass characteristics.

The third element in the symbol indicates the degree of hazard or limitation, and the general suitability of the soils for certain kinds of trees. The three limitations affecting management that are considered here are erosion hazard, equipment restrictions, and seedling mortality.

Erosion hazard refers to the risk of erosion in properly managed stands. Length and steepness of slope, texture, and permeability are among the soil characteristics considered. A rating of *slight* means that erosion is not a major problem; *moderate* means that management is needed to prevent erosion during harvesting operations and in cleared areas; and *severe* means that intensive management is needed to control erosion.

Equipment restrictions are *slight* if there is little or no restriction on the type of equipment or time of year that it can be used; *moderate* if use of equipment is restricted for 3 months or less each year because of steep slopes or wetness; and *severe* if very steep slopes make special harvesting methods necessary, or if use of equipment is restricted for more than 3 months each year because soils are wet.

Seedling mortality refers to the expected loss of natural or planted tree seedlings caused by soil characteristics and topographic features and excluding losses caused by plant competition. *Slight* means that losses normally are not more than 25 percent of the stock; *moderate* means that losses are between 25 and 50 percent; and *severe* means that more than half the stock is likely to die.

The degree of hazard or limitation is rated as follows:

The *numeral 1* indicates soils that have no to slight limitations affecting management and are best suited to needleleaf trees.

The *numeral 2* indicates soils that have one or more moderate limitations affecting management and are best suited to needleleaf trees.

The *numeral 3* indicates soils that have one or more severe limitations affecting management and are best suited to needleleaf trees.

The *numeral 4* indicates soils that have no to slight limitations affecting management and are best suited to broadleaf trees.

The *numeral 5* indicates soils that have one or more moderate limitations affecting management and are best suited to broadleaf trees.

The *numeral 6* indicates soils that have one or more severe limitations affecting management and are best suited to broadleaf trees.

The *numeral 7* indicates soils that have no to slight limitations affecting management and are suited to both needleleaf and broadleaf trees.

The *numeral 8* indicates soils that have one or more moderate limitations affecting management and are suited to both needleleaf and broadleaf trees.

The *numeral 9* indicates soils that have one or more severe limitations affecting management and are suited to both needleleaf and broadleaf trees.

The *numeral 0* indicates that the soils are not suited to the production of major commercial wood products.

Production of forage [5]

The amount of forage produced in a woodland area varies with the age of the trees, the density of the canopy, and the forage value of the vegetation. For the purpose of this survey, four canopy classes are recognized. An open canopy shades up to 20 percent of the ground at midday; a sparse canopy, 21 to 35 percent; a medium canopy, 36 to 55 percent; and a dense canopy, 56 to 70 percent. The potential yields of forage, by canopy class, for each woodland group are shown in table 5.

Forage value is a rating given the vegetation in relation to its potential to furnish quality and quantity of forage for livestock production. *High* is the value given if the forage is most desirable, *moderate* is given if forage is moderately desirable, and *low* is given if forage is least desirable.

The principal forage plants listed in table 5 are those that are present when at least 70 percent of the understory is made up of high-value plants and the canopy is 45 percent or less. As the canopy closes, these plants are replaced by shade-tolerant woody species, and forage yields become progressively lower.

Engineering Uses of the Soils [6]

This section is useful to those who need information about soils used as structural material or as foundation upon which structures are built. Among those who can benefit from this section are planning commissions, town and city managers, land developers, engineers, contractors, and farmers.

Among properties of soils highly important in engineering are permeability, strength, compaction characteristics, soil drainage condition, shrink-swell potential, grain size, plasticity, and soil reaction. Also important are depth to the water table, depth to bedrock, and soil slope. These properties, in various degrees and combinations, affect construction and maintenance of roads, airports, pipelines, foundations for small buildings, irrigation systems, ponds and small dams, and systems for disposal of sewage and refuse.

Information in this section of the soil survey can be helpful to those who—

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[5] DAVID W. SANDERS, range conservationist, Soil Conservation Service, helped prepare this section.

[6] PAUL A. CALHOUN, engineer, Soil Conservation Service, helped prepare this section.

1. Select potential residential, industrial, commercial, and recreational areas.
2. Evaluate alternate routes for roads, highways, pipelines, and underground cables.
3. Seek sources of gravel, sand, or clay.
4. Plan farm drainage systems, irrigation systems, ponds, terraces, and other structures for controlling water and conserving soil.
5. Correlate performance of structures already built with properties of the kinds of soil on which they are built, for the purpose of predicting performance of structures on the same or similar kinds of soil in other locations.
6. Predict the trafficability of soils for cross-country movement of vehicles and construction equipment.
7. Develop preliminary estimates pertinent to construction in a particular area.

Most of the information in this section is presented in tables 6, 7, and 8, which show, respectively, several estimated soil properties significant in engineering, interpretations for various engineering uses, and results of engineering laboratory tests on soil samples.

This information, along with the soil map and other parts of this publication, can be used to make interpretations in addition to those given in tables 6 and 7, and it also can be used to make other useful maps.

This information, however, does not eliminate need for further investigations at sites selected for engineering works, especially works that involve heavy loads or that require excavations to depths greater than those shown in the tables, generally depths greater than 6 feet. Also, inspection of sites, especially the small ones, is needed because many delineated areas of a given soil mapping unit may contain small areas of other kinds of soil that have strongly contrasting properties and different suitabilities or limitations for soil engineering.

Some of the terms used in this soil survey have special meaning to soil scientists that is not known to all engineers. The Glossary defines many of these terms commonly used in soil science.

Soil classification systems

The two systems most commonly used in classifying samples of soils for engineering are the Unified system used by the SCS engineers, Department of Defense, and others, and the AASHO system adopted by the American Association of State Highway Officials.

In the Unified system (*13*) soils are classified according to particle size distribution, plasticity, liquid limit, and organic matter. Soils are grouped in 15 classes. There are eight classes of coarse-grained soils, identified as GW, GP, GM, GC, SW, SP, SM, and SC; six classes of fine-grained soils, identified as ML, CL, OL, MH, CH, and OH; and one class of highly organic soils, identified as Pt. Soils on the borderline between two classes are designated by symbols for both classes; for example ML-CL.

The AASHO system (*1*) is used to classify soils according to those properties that affect use in highway construction and maintenance. In this system, a soil is placed in one of seven basic groups ranging from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. In group A-1 are gravelly soils of high bearing strength, or the best soils for subgrade (foundation). At the other extreme, in group A-7, are clay soils that have low strength when wet and that are the poorest soils for subgrade. Where laboratory data are available to justify a further breakdown, the A-1, A-2, and A-7 groups are divided as follows: A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, and A-7-6. As additional refinement, the engineering value of a soil material can be indicated by a group index number. Group indexes range from 0 for the best material to 20 or more for the poorest. The AASHO classification for tested soils, with group index numbers in parentheses, is shown in table 8; the estimated classification, without group index numbers, is given in table 6 for all soils mapped in the survey area.

Estimated engineering properties

Table 6 provides estimates of soil properties important in engineering. The estimates are based on field classification and descriptions, on physical and chemical tests of selected representative samples, on test data from comparable soils in adjacent areas, and on experience in working with the soils in Harrison County.

Each kind of soil that is given a separate rating is listed in alphabetical order. The mapping units are shown by placing the map symbols after the name of the soil series. Where important differences in engineering properties occur between mapping units of a series, these phases are rated separately. Ratings apply only to the depths indicated. Bedrock is well below these depths. Terms used in the table are explained in the following paragraphs.

The depth to seasonal high water table is the highest level to which water rises.

USDA texture is determined by the relative proportions of sand, silt, and clay material less than 2.0 millimeters in diameter. Sand, silt, clay, and other terms used in the USDA textural classification are defined in the Glossary.

Permeability indicates the rate at which water moves downward through undisturbed soil material. The rate depends largely on texture, porosity, and structure of the soil. A rate of less than 0.06 inch per hour is very slow; 0.06 to 0.2 inch is slow; 0.2 to 0.63 inch, moderately slow; 0.63 to 2 inches, moderate; 2.0 to 6.3 inches, moderately rapid; 6.3 to 20 inches, rapid; and more than 20 inches, very rapid. The estimated rates should not be confused with the permeability coefficient "K" as used by engineers.

Available water capacity refers to the capacity of a soil to hold water available for use by most plants. It is commonly defined as the difference between the amount of water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. Available water capacity is affected by the texture, structure, and organic-matter content of the soil.

Reaction refers to the degree of acidity or alkalinity of a soil, expressed as a pH value. A pH value of 7.0 is neutral. Lower values indicate acidity and higher values indicate alkalinity.

Shrink-swell potential indicates the volume change to be expected in soil material with changes in moisture content. Shrinking and swelling of soils cause much damage to roads, building foundations, and other structures. A high shrink-swell potential indicates hazards to the maintenance of structures constructed in, on, or with such materials.

TABLE 6.—*Estimates of soil properties*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in referring to other series that appear in the first

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification		
			USDA texture	Unified	AASHO
	Inches	*Inches*			
Atmore: At	(1)	0–39	Silt loam	ML, ML–CL	A–4
		39–51	Loam	CL or ML	A–4, A–6
		51–59	Clay	CL	A–7
		59–78	Clay loam	CL	A–6 or A–7
Coastal beach: Cb. No valid estimates can be made. Material varies with the tide.					
Escambia: Es	15–30	0–25	Silt loam and very fine sandy loam.	ML	A–4
		25–59	Loam	ML or CL	A–4 or A–6
		59–87	Clay loam	CL	A–6 or A–7
*Eustis: EtB, EuE. For Poarch part of EuE, refer to Poarch series.	60–120	0–83	Loamy sand	SM	A–2–4
Handsboro: Ha	(2)	0–60	Sapric material that has loamy strata.	Pt	------------
Harleston: HlA, HlB	18–24	0–43	Fine sandy loam	ML or SM	A–4
		43–58	Sandy clay loam	SC or CL	A–6
		58–98	Fine sandy loam	ML or SM	A–4
Hyde: Hy	(1)	0–16	Silt loam	CL	A–6
		16–60	Silty clay loam	CL	A–7
Jena. Mapped only with Nugent soils.	(3)	0–35	Fine sandy loam	SM	A–4
		35–43	Loamy sand	SM	A–2–4
		43–60	Fine sandy loam	SM	A–4
Lakeland: Lr	60–120	0–60	Fine sand	SP–SM	A–3
		60–72	Sand	SP–SM or SP	A–3
Latonia: Lt	60–120	0–9	Loamy sand	SM	A–2–4
		9–27	Sandy loam	SM	A–2–4 or A–4
		27–47	Loamy sand	SM	A–2–4
		47–69	Sand	SP or SP–SM	A–3
McLaurin: MlB, MlC	>60	0–34	Fine sandy loam	SM or ML	A–4
		34–43	Loamy sand	SM	A–2–4
		43–49	Sandy loam	SM or SM–SC	A–2–4 or A–4
		49–60	Sandy clay loam	SC or CL	A–6
Nahunta: Nh	0–15	0–20	Silt loam	ML	A–4
		20–60	Silty clay loam	CL	A–6

See footnotes at end of table.

significant in engineering

such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions for column of this table. The symbol > means more than]

Percentage passing sieve—				Permeability	Available water capacity	Reaction	Shrink-swell potential	Corrosivity	
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.074 mm.)					Uncoated steel	Concrete
				Inches per hr.	*Inches per inch of soil depth*	*pH value*			
--------	100	95–100	70–85	0. 63–2. 0	0. 18–0. 24	4. 0–5. 5	Low	High	Moderate to high.
--------	100	85–100	60–85	0. 63–2. 0	0. 12–0. 18	4. 0–5. 5	Low	High	Moderate to high.
--------	100	90–100	75–95	0. 06–0. 20	0. 10–0. 18	4. 0–5. 5	Moderate	High	Moderate to high.
--------	100	90–100	70–80	0. 20–0. 63	0. 12–0. 20	4. 0–5. 5	Low	High	Moderate to high.
--------	100	85–98	50–80	0. 63–2. 0	0. 17–0. 28	4. 5–5. 5	Low	Moderate	High.
--------	100	85–100	60–85	0. 63–2. 0	0. 10–0. 18	4. 5–5. 5	Low	Moderate	High.
--------	100	90–100	75–85	0. 06–0. 20	0. 10–0. 18	4. 5–5. 5	Low	Moderate	High.
--------	100	50–75	15–30	2. 0–6. 3	0. 05–0. 10	4. 5–5. 5	Low	Low	High.
--------	--------	--------	--------	0. 63–2. 0	0. 22–0. 25	6. 6–8. 4	--------	Very high	High.
--------	100	70–85	40–55	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low	Moderate	High to moderate.
--------	100	80–90	35–55	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low	Moderate	High to moderate.
--------	100	70–85	45–55	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low	Moderate	High to moderate.
--------	100	90–100	70–90	0. 63–2. 0	0. 15–0. 20	4. 5–5. 5	Low	High	High to moderate.
--------	100	95–100	85–95	0. 20–0. 63	0. 20–0. 22	4. 5–5. 5	Moderate	High	Moderate to high.
--------	100	70–85	40–50	0. 63–2. 0	0. 09–0. 12	4. 5–5. 5	Low	Low	High.
--------	100	50–75	15–30	6. 3–20. 0	0. 05–0. 10	4. 5–5. 5	Low	Low	Moderate to high.
--------	100	85–95	40–50	2. 0–6. 3	0. 09–0. 12	4. 5–5. 5	Low	Low	Moderate to high.
--------	100	60–80	5–10	6. 3–20. 0	0. 02–0. 06	4. 5–5. 5	Low	Low	Moderate to high.
--------	100	51–70	3–10	6. 3–20. 0	0. 02–0. 06	4. 5–5. 5	Low	Low	Moderate to high.
--------	100	50–75	15–30	2. 0–6. 3	0. 05–0. 10	4. 5–5. 5	Low	Low	Moderate to high.
--------	100	60–70	30–40	2. 0–6. 3	0. 12–0. 15	4. 5–5. 5	Low	Low	Moderate to high.
--------	100	60–75	15–30	2. 0–6. 3	0. 05–0. 10	4. 5–5. 5	Low	Low	Moderate to high.
--------	100	51–70	3–10	6. 3–20. 0	0. 01–0. 05	4. 5–5. 5	Low	Low	Moderate to high.
--------	100	70–85	40–55	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low	Low	High to moderate.
--------	100	50–75	15–30	6. 3–20. 0	0. 05–0. 10	4. 5–5. 5	Low	Low	High to moderate.
--------	100	70–80	30–40	2. 0–6. 3	0. 10–0. 15	4. 5–5. 5	Low	Low	High to moderate.
--------	100	80–90	35–55	0. 63–2. 0	0. 15–0. 20	4. 5–5. 5	Low	Low	High to moderate.
--------	100	90–100	70–90	0. 63–2. 0	0. 15–0. 20	4. 5–5. 5	Low	High	High to moderate.
--------	100	95–100	85–95	0. 20–0. 63	0. 20–0. 22	4. 5–5. 5	Moderate	High	High to moderate.

TABLE 6.—*Estimates of soil properties*

Soil series and map symbols	Depth to seasonal high water table	Depth from surface	Classification: USDA texture	Classification: Unified	Classification: AASHO
*Nugent: Nu. For Jena part, refer to Jena series.	(3)	0–8	Fine sandy loam	SM or ML	A–4
		8–14	Loamy sand	SM	A–2–4
		14–25	Very fine sandy loam	ML	A–4
		25–60	Loamy sand	SM	A–2–4
Ocilla: Oc	0–15	0–21	Loamy sand	SM	A–2–4
		21–67	Sandy loam	SM	A–2–4 or A–4
Plummer: Pm	0–15	0–43	Loamy sand	SM	A–2–4
		43–64	Sandy loam	SM	A–2–4
		64–72	Loamy sand	SM	A–2–4
Poarch: PoA, PoB, PoC	>50	0–59	Fine sandy loam	SM or ML	A–4
		59–73	Fine sandy loam	SM or ML	A–4 or A–2
		73–84	Sandy clay loam	SC or CL	A–6
*Ponzer: Ps. For Smithton part, refer to Smithton series.	0–15	0–18	Organic matter	Pt	A–7
		18–60	Fine sandy loam	SM	A–4
Ruston: RuA, RuB, RuC, RuD	60–120	0–12	Fine sandy loam	SM	A–4
		12–48	Sandy clay loam	SC or CL	A–6 or A–7
		48–59	Fine sandy loam	SM or ML	A–4
		59–81	Sandy clay loam	SC	A–6 or A–4
*Saucier: SfB, SfC, ShC, SnB. For Smithton and Susquehanna parts of ShC, refer to Smithton and Susquehanna series. For Susquehanna part of SnB, refer to that series.	15–30	0–12	Fine sandy loam	SM or ML	A–4
		12–38	Loam	ML or CL	A–4 or A–6
		38–48	Clay loam	CL	A–6 or A–7
		48–60	Silty clay loam	CL	A–6 or A–7
		60–72	Clay	CH, MH	A–7
Smithdale: SsE	60–120	0–10	Fine sandy loam	SM or ML	A–4
		10–51	Sandy clay loam	SC or CL	A–6
		51–80	Sandy loam	SM	A–2–4 or A–4
Smithton: St	0–15	0–19	Fine sandy loam	SM or ML	A–4
		19–65	Sandy loam	SM or SM–SC	A–2–4 or A–4
		65–72	Loam	ML or CL	A–4 or A–6
St. Lucie: Su, Sv	60–120	0–60	Fine sand	SM	A–2–4
Sulfaquepts: Sw	15–30	0–13	Sand	SP–SM	A–3, A–2–4
		13–50	Sand	SP–SM	A–3, A–2–4
Susquehanna. Mapped only with Saucier and Smithton soils.	15–30	0–8	Fine sandy loam	ML, SM	A–4
		8–60	Clay	CH	A–7

[1] Water table at or near the surface during winter and spring.
[2] Water table at or above the surface most of the time; daily tidal flooding.

significant in engineering—Continued

Percentage passing sieve—				Permea-bility	Available water capacity	Reaction	Shrink-swell potential	Corrosivity	
No. 4 (4.7 mm.)	No. 10 (2.0 mm.)	No. 40 (0.42 mm.)	No. 200 (0.07 mm.)					Uncoated steel	Concrete
--------	100	70–85	40–55	0. 63–2. 0	0. 10–0. 15	4. 5–6. 5	Low	Low	Moderate.
--------	100	50–75	15–30	6. 3–20. 0	0. 05–0. 10	4. 5–6. 5	Low	Low	Moderate.
--------	100	85–95	50–65	2. 0–6. 3	0. 08–0. 12	4. 5–6. 5	Low	Low	Moderate.
--------	100	50–75	15–30	2. 0–6. 3	0. 05–0. 10	4. 5–6. 5	Low	Low	Moderate.
95–100	95–100	50–75	15–30	2. 0–6. 3	0. 06–0. 10	4. 5–5. 5	Low	Moderate	High.
95–100	95–100	60–70	30–40	0. 63–2. 0	0. 10–0. 14	4. 5–5. 5	Low	Moderate	High.
--------	100	50–75	15–30	6. 3–20. 0	0. 05–0. 10	4. 5–5. 5	Low	High	High.
--------	100	60–70	30–40	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low	High	High.
--------	100	50–75	15–30	6. 3–20. 0	0. 05–0. 10	4. 5–5. 5	Low	High	High.
--------	100	70–97	40–55	0. 63–2. 0	0. 09–0. 15	4. 5–5. 5	Low	Low	Moderate.
--------	100	70–97	33–55	0. 20–0. 63	0. 10–0. 15	4. 5–5. 0	Low	Low	Moderate.
--------	100	80–90	35–55	0. 20–0. 63	0. 07–0. 10	4. 5–5. 0	Low	Low	Moderate.
--------	--------	--------	--------	0. 63–2. 0	0. 24–0. 26	4. 0–5. 5	High	High	High.
--------	100	70–85	40–50	0. 63–2. 0	0. 10–0. 13	4. 0–5. 5	Low	High	High.
--------	100	70–85	40–50	0. 63–2. 0	0. 11–0. 15	4. 5–5. 5	Low	Low	Moderate.
--------	100	80–90	35–55	0. 63–2. 0	0. 12–0. 17	4. 5–5. 5	Low	Low	Moderate.
--------	100	70–85	40–55	0. 63–2. 0	0. 11–0. 15	4. 5–5. 5	Low	Low	Moderate.
--------	100	80–90	35–50	0. 63–2. 0	0. 14–0. 18	4. 5–5. 5	Low	Low	Moderate.
100	70–80	70–85	40–55	2. 0–6. 3	0. 12–0. 15	4. 0–5. 5	Low	High to moderate	High to moderate.
100	60–75	85–95	60–75	0. 63–2. 0	0. 16–0. 19	4. 0–5. 5	Low	High to moderate	High to moderate.
100	90–100	90–100	70–80	0. 20–0. 63	0. 16–0. 19	4. 0–5. 5	Low	High to moderate	High to moderate.
100	90–100	95–100	85–95	0. 06–0. 20	0. 16–0. 20	4. 0–5. 5	Low	High to moderate	High to moderate.
100	90–100	90–100	80–90	0. 06–0. 20	0. 16–0. 20	4. 0–5. 5	Moderate	High to moderate	High to moderate.
--------	100	70–85	40–55	2. 0–6. 3	0. 10–0. 15	4. 5–5. 5	Low	Low	Moderate.
--------	100	80–90	35–55	0. 63–2. 0	0. 14–0. 17	4. 5–5. 5	Low	Low	Moderate.
--------	100	60–70	30–40	2. 0–6. 3	0. 10–0. 14	4. 5–5. 5	Low	Low	Moderate.
--------	100	70–85	40–55	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low	High	Moderate to high.
--------	100	60–70	30–40	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low	High	Moderate to high.
--------	100	85–95	60–75	0. 20–0. 63	0. 10–0. 15	4. 5–5. 5	Low	High	Moderate to high.
--------	100	65–80	5–10	>20. 0	0. 02–0. 06	6. 1–7. 3	Low	Very high	High.
--------	100	50–70	5–15	6. 3–20. 0	0. 02–0. 06	4. 0–6. 0	Low	Very high	High.
--------	100	50–70	5–15	6. 3–20. 0	0. 02–0. 06	7. 9–9. 0	Low	Very high	High.
--------	100	70–85	45–55	0. 63–2. 0	0. 10–0. 15	4. 5–5. 5	Low	High	Moderate to high.
--------	100	90–100	75–95	0–0. 06	0. 14–0. 18	4. 5–5. 5	High	High	Moderate to high.

[3] Water table within a depth of 60 inches for very brief periods.

TABLE 7.—*Engineering*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils in for referring to other series that appear

Soil series and map symbols	Suitability as source of—		
	Topsoil	Sand	Road fill (subgrade)
Atmore: At	Poor: wetness	Unsuited: improbable source; excess fines.	Poor: wetness
Coastal beach: Cb. No interpretations. Material variable.			
Escambia: Es	Good	Unsuited: improbable source; excess fines.	Fair: fair traffic-supporting capacity; wetness.
*Eustis: EtB	Poor: sandy texture	Poor: in places needs washing; excess fines.	Good
EuE. For Poarch part of EuE, refer to Poarch series.	Poor: sandy texture	Poor: in places needs washing; excess fines.	Good
Handsboro: Ha	Poor: wetness; sulfur content.	Unsuited: improbable source; excess fines.	Unsuited: sapric material
Harleston: HlA, HlB	Good	Unsuited: improbable source; excess fines.	Fair: fair traffic-supporting capacity.
Hyde: Hy	Poor: wetness	Unsuited: improbable source; excess fines.	Poor: wetness
Jena: Mapped only with Nugent soils.	Good	Poor: improbable source	Good
Lakeland: Lr	Poor: sandy texture	Fair: may need washing	Good
Latonia: Lt	Good	Fair to poor: excess fines need to be washed out.	Good
McLaurin: MlB, MlC	Good	Poor: improbable source	Good
Nahunta: Nh	Good	Unsuited: improbable source; excess fines.	Fair: fair traffic-supporting capacity.
*Nugent: Nu. For Jena part of Nu, refer to Jena series.	Fair: thickness of suitable material.	Unsuited: improbable source; excess fines.	Good
Ocilla: Oc	Poor: loamy sand surface layer.	Poor: excess fines	Good

interpretations

such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions in the first column of this table]

Soil features affecting—				
Pond reservoir areas	Embankments, dikes, and levees	Drainage for crops and pasture	Irrigation	Terraces and diversions
Slow permeability in lower part.	Medium to low strength; fair stability.	Poorly drained; lacks outlets; floods.	Medium to high available water capacity; slow permeability in lower part.	Nearly level.
Slow permeability	Medium to low strength; fair stability.	Somewhat poorly drained.	Medium available water capacity; slow permeability in lower part.	Nearly level.
Moderately rapid permeability.	Moderately rapid permeability; needs binder.	Somewhat excessively drained.	Moderately rapid permeability; low available water capacity.	Soil features favorable.
Moderately rapid permeability.	Moderately rapid permeability; needs binder.	Somewhat excessively drained.	Moderately rapid permeability; low available water capacity.	Slopes of more than 8 percent; erosion hazard.
Excess seepage if water table lowered; subject to daily tidal flooding.	Unstable embankment material.	Subject to daily tidal flooding; becomes extremely acid if drained.	Subject to daily tidal flooding; becomes extremely acid if drained.	Subject to daily tidal flooding.
Moderate permeability	Medium to low strength; fair stability.	Surface drainage needed where level; moderately well drained.	Medium available water capacity.	Soil features favorable.
Moderately slow permeability.	Medium to low strength; fair stability.	Floods; lacks outlets; very poorly drained.	Moderately slow permeability; high available water capacity.	Nearly level.
Moderate to moderately rapid permeability.	Fair to poor resistance to piping; fair slope stability; low to medium permeability where compacted.	Well drained	Medium available water capacity; flooding.	Soil features favorable.
Rapid permeability	Rapid permeability; needs binder; poor slope stability.	Excessively drained	Low available water capacity; rapid permeability.	Soil material is sand throughout upper 6 feet.
Moderately rapid permeability.	Fair slope stability; fair to poor resistance to piping and erosion.	Well drained	Medium available water capacity; moderately rapid permeability.	Soil features favorable; loamy sand and sand below a depth of 27 inches.
Moderate to moderately rapid permeability.	Fair slope stability; fair to poor resistance to piping and erosion.	Well drained	Medium available water capacity.	Soil features favorable.
Moderately slow permeability.	Fair slope stability	Somewhat poorly drained.	Moderately slow permeability; high available water capacity.	Nearly level.
Moderately rapid permeability.	Poor to medium resistance to piping and erosion; fair slope stability.	Excessively drained	Low available water capacity; flooding; moderately rapid permeability.	Nearly level.
High seepage potential	Needs binder; moderate permeability.	Somewhat poorly drained.	Low to medium available water capacity.	Nearly level.

TABLE 7.—*Engineering*

Soil series and map symbols	Suitability as source of—		
	Topsoil	Sand	Road fill (subgrade)
Plummer: Pm	Poor: thick loamy sand surface layer; wetness.	Poor: excess fines	Poor: wetness
Poarch:			
PoA, PoB, PoC	Good	Unsuited: improbable source; excess fines.	Fair: fair traffic-supporting capacity.
Poarch part of EuE	Fair: slope	Unsuited: improbable source; excess fines.	Fair: fair to good traffic-supporting capacity.
*Ponzer: Ps. For Smithton part of Ps, refer to Smithton series.	Poor: wetness	Unsuited: improbable source; excess fines.	Poor: poor traffic-supporting capacity; wetness.
Ruston:			
RuA, RuB, RuC	Fair: sandy clay loam at a depth of 12 inches.	Unsuited: improbable source; excess fines.	Fair: fair traffic-supporting capacity.
RuD	Fair: slope	Unsuited: improbable source; excess fines.	Fair: fair traffic-supporting capacity.
*Saucier:			
SfB, SfC	Good	Unsuited: improbable source; excess fines.	Fair: fair traffic-supporting capacity.
ShC, SnB. For Smithton and Susquehanna parts of ShC, refer to Smithton and Susquehanna series. For Susquehanna part of SnB, refer to that series.	Fair: slope	Unsuited: improbable source; excess fines.	Fair: fair traffic-supporting capacity.
Smithdale: SsE	Fair: sandy clay loam texture below a depth of 10 inches.	Unsuited: improbable source; excess fines.	Good
Smithton: St	Poor: wetness	Unsuited: excess fines	Poor: wetness
St. Lucie: Su, Sv	Poor: sandy texture	Poor: grain size	Good
Sulfaquepts: Sw	Poor: sandy texture; sulfur content.	Fair: needs washing	Poor: high sulfur content
Susquehanna part of ShC	Poor: depth to clay	Unsuited: clay texture	Poor: high shrink-swell potential.
Susquehanna part of SnB	Poor: depth to clay	Unsuited: clay texture	Poor: high shrink-swell potential.

interpretations—Continued

Soil features affecting—				
Pond reservoir areas	Embankments, dikes, and levees	Drainage for crops and pasture	Irrigation	Terraces and diversions
High seepage potential	Needs binder; rapid permeability to a depth of 43 inches and below a depth of 64 inches.	Lacks outlets; poorly drained.	Rapid permeability; low available water capacity.	Nearly level.
Moderately slow permeability.	Fair to poor resistance to piping and erosion.	Well drained	Medium available water capacity.	Soil features favorable.
Moderately slow permeability.	Poor to fair resistance to piping and erosion.	Well drained	Slope	Slope.
Unstable material	Upper 18 inches unsuited; fair to poor resistance to piping and erosion.	Lacks outlets; wetness	Wetness; lacks outlets	Nearly level; wetness.
Moderate to high seepage potential.	Low to medium strength; fair stability.	Well drained	Medium to high available water capacity.	Soil features favorable.
Moderate to high seepage potential.	Low to medium strength; fair stability.	Well drained	Medium to high available water capacity.	Slopes more than 8 percent; erosion hazard.
Slow permeability	Fair slope stability; medium to low strength.	Moderately well drained	High available water capacity.	Soil features favorable.
Slow permeability	Fair slope stability; medium to low strength.	Moderately well drained	High available water capacity.	Soil features favorable; subject to erosion on more than 8 percent slopes.
High seepage potential	Slight to moderate: moderate permeability; medium strength.	Well drained	Slopes more than 12 percent; medium available water capacity; rapid runoff.	Slopes more than 12 percent; erosion hazard.
Moderate to moderately slow permeability.	Low to medium strength	Poorly drained; lacks outlets.	Medium available water capacity; moderate to moderately slow permeability.	Nearly level slopes.
Very rapid permeability	Very rapid permeability	Excessively drained	Low available water capacity.	Soil material is fine sand; excessively drained.
Rapid permeability	Rapid permeability	High sulfur content; highly acid soil material cannot grow vegetative cover.	High water table; highly acid soil material cannot grow common vegetation.	Nearly level slopes.
Very slow permeability	Fair to poor slope stability; high compressibility.	Somewhat poorly drained; very slow permeability.	Very slow permeability	Soils difficult to work; erosion hazard where slopes are more than 8 percent.
Very slow permeability	Fair to poor slope stability; high compressibility.	Somewhat poorly drained; very slow permeability.	Very slow permeability	Soils difficult to work.

TABLE 8.—*Engineering*

[Tests performed by Mississippi State Highway

Soil name and location	Parent material	Report No.	Depth	Moisture-density [1]	
				Maximum dry density	Optimum moisture
			Inches	*Lb/cu ft*	*Percent*
Atmore silt loam: 3 miles northwest of Biloxi, along State Highway 67, 1 mile north along State Highway 15, and 90 yards into a pasture. SE¼NW¼ sec. 29, T. 6 S., R. 9 W. Modal.	Loamy marine deposits.	615818	9–30	112	14
		615819	30–39	112	13
		615820	39–51	107	19
Escambia silt loam: 1 mile north of State Highway 67 along State Highway 15, and 50 yards northwest. NE¼NW¼ sec. 32, T. 6 S., R. 9 W. Modal.	Loamy marine deposits.	598807	4–16	112	12
		598808	35–59	109	16
Poarch fine sandy loam: 1.1 miles north of State Highway 67 at Cedar Lake, along a blacktop road, and 70 yards west into a pasture. NW¼NE¼ sec. 36, T. 6 S., R. 10 W. Modal.	Loamy marine deposits.	598805	11–24	122	10
		598806	52–73	116	13

[1] Based on AASHO Designation: T 99–57, Method A (*1*).

[2] Mechanical analysis according to AASHO Designation: T 88–57 (*1*). Results by this procedure may differ somewhat from results obtained by the soil survey procedure of the Soil Conservation Service (SCS). In the AASHO procedure, the fine material is analyzed by the hydrometer method and the various grain-size fractions are calculated on the basis of all the material, including that coarser than 2 millimeters in diameter. In the SCS soil survey procedure, the fine material is analyzed by the pipette method and the material coarser than 2 millimeters in diameter is excluded from calculations of grain-size fractions. The mechanical analysis data used in this table are not suitable for naming textural classes for soils.

Corrosion of buried uncoated steel pipe is affected by the amount of soil acidity, fluctuating moisture content, drainage, texture, and presence of soluble metallic salts, sulfates, or any substance in the soil which affects electrical resistivity when moist.

Concrete pipe buried in the soil may deteriorate. Rate of deterioration is affected by soil texture and acidity, amount of sodium or magnesium sulfate present, and amount of sodium chloride present. Sodium chloride does not corrode concrete. It helps identify the presence of sea water, which contains sulfates. Sulfates are one of the principal corrosive agents. Special cements and manufacturing methods can make concrete pipes last longer in soils where corrosivity is high.

Engineering interpretations

Table 7 contains information useful to engineers and others who plan to use soil material in construction of highways, farm facilities, and buildings. Detrimental or undesirable features are emphasized, but very important desirable features also are listed. The ratings and other interpretations in this table are based on the estimated engineering properties of the soils shown in table 6, and on field experience. The information applies to soil depths of 6 feet or less. The terms used in the table are explained in the following paragraphs.

Topsoil refers to soil material used to topdress lawns, roadbanks, and the like. The ratings indicate suitability for such use, and are based mainly on fertility and organic-matter content.

Ratings for sand are based on the probability that areas of the soil contain deposits of sand coarser than 0.08 millimeter in diameter. Sand commonly is used for filter drains, as aggregate for concrete, and as granular subbase for roads. The ratings do not indicate the quality or extent of deposits.

Road fill is material used to build embankments that support the subbase, base, or surface course of roads. The ratings are based on the performance of soil material removed from borrow areas and used for highway subgrade. In general, a sandy material that contains adequate binder is best. Organic materials and plastic clays that have high shrink-swell potential are the poorest. Eustis, Latonia, and Nugent soils generally are the best sources of road fill in the county.

Farm ponds supply water for livestock and offer opportunities for recreation. They are affected mainly by soil features that influence the rate of seepage. Soils that have moderate to slow permeability, and consequently have slow seepage, can be used for reservoir areas. Embankments are earth-filled dams constructed to impound water. Features that influence the strength and stability of disturbed and compacted soil materials are given.

Agricultural drainage is affected mainly by the presence of a water table, soil permeability, and depth to cemented layers, sand, or other material that impedes or accelerates the movement of water through the soil. Slope also is an important factor. Most nearly level soils in the county require drainage for crops, but the gently sloping to strongly sloping soils generally do not.

Irrigation systems are affected by such features as slope, erodibility, permeability, and drainage.

Terraces and diversions are essential for effective erosion control and for protecting areas downslope from

test data

Department Testing Division, Jackson, Miss.]

Mechanical analysis [2]								Liquid limit	Plasticity index	Classification	
Percentage passing sieve—				Percentage smaller than—						AASHO	Unified
No. 10 (2.0 mm)	No. 40 (0.42 mm)	No. 60 (0.25 mm)	No. 200 (0.074 mm)	0.05 mm	0.02 mm	0.005 mm	0.002 mm				
								Percent			
100	------------	98	82	69	44	17	11	19	3	A-4(5)	ML
100	------------	98	82	71	44	21	16	22	5	A-4(5)	ML-CL
100	------------	98	83	73	54	32	25	39	18	A-6(15)	CL
100	98	95	73	53	29	9	6	--------	[3] NP	A-4(0)	ML
100	99	97	82	70	49	31	26	38	17	A-6(11)	CL
100	97	85	41	34	27	16	12	--------	NP	A-4(0)	SMd
100	97	82	33	28	24	19	17	26	6	A-2(0)	SMd

[3] Nonplastic.

runoff. Shallowness of the soils and irregular and steep topography are among the features unfavorable for this use.

Engineering test data

Soil samples of some of the major series in Harrison County were tested in accordance with standard procedures to help evaluate the soils for engineering purposes. Table 8 shows the results of tests to determine particle-size distribution and other properties significant in soil engineering. Some terms used in table 8 are explained in the following paragraphs.

In a moisture-density or compaction test, a sample of soil material is compacted several times at the same compactive force, each time at a higher moisture content. The dry density (unit weight) of the soil material increases until optimum moisture content is reached. After that, the dry density decreases with an increase of moisture content. The highest dry density obtained is the maximum dry density. Moisture density data are important in earthwork because, as a rule, optimum stability is obtained if the soil is compacted to about maximum stability when it is at approximately optimum moisture content.

Mechanical analysis shows the percentage, by weight, of soil particles that pass sieves of specified sizes. Sand and other coarser materials do not pass the No. 200 sieve, but silt and clay do. In the AASHO system, silt is identified as material finer than 0.074 millimeter yet coarser than 0.005 millimeter. Clay is material finer than 0.005 millimeter. The particle-size distribution of materials passing the No. 200 sieve was determined by the hydrometer method.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of soil material. As the moisture content of a clayey soil is increased from a dry state, the material changes from a semisolid to a plastic state. The plastic limit is the moisture content at which the soil passes from semisolid to plastic. If the moisture content is further increased, the material changes from a plastic to a liquid state. The liquid limit is the moisture content at which the material changes from plastic to liquid. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which a soil material is plastic.

Town and Country Planning [7]

This section provides information that can be used by planners, builders, developers, landscape architects, and others interested in these nonfarm uses of the soils.

The degree and kind of soil limitations for selected nonfarm uses are given in table 9. Among the important soil features considered are depth, acidity, slope, permeability, wetness, traffic-supporting capacity, and flood hazards. The information given in the table does not eliminate the need for onsite investigation, but it can help guide the selection of sites for a given use.

In table 9 soils are rated according to three degrees of limitations: slight, moderate, and severe.

Slight limitations are so minor that they can easily be overcome. Good performance and low maintenance can be expected from these soils.

[7] GEORGE W. YEATES, staff conservationist, Soil Conservation Service, assisted in preparing this section.

TABLE 9.—*Degree and kind of soil limitations*

[An asterisk in the first column indicates that at least one mapping unit in this series is made up of two or more kinds of soil. The soils
for referring to other series that

Soil series and map symbols	Dwellings without basements	Sewage lagoons	Septic tank absorption fields	Local roads and streets
Atmore: At	Severe: wetness	Slight	Severe: wetness	Severe: wetness
Coastal beach: Cb. Variable material.				
Escambia: Es	Moderate: wetness	Slight	Severe: slow permeability.	Moderate: wetness; fair traffic-supporting capacity.
*Eustis:				
EtB	Slight	Severe: moderately rapid permeability.	Slight: possible contamination of shallow water supplies.	Slight
EuE. For Poarch part of EuE, refer to Poarch series.	Moderate: slope	Severe: moderately rapid permeability.	Moderate: slope; possible contamination of shallow water supplies.	Moderate: slope
Handsboro: Ha	Severe: flooding; wetness; very low bearing capacity.	Severe: unstable levee material; flooding; organic matter.	Severe: flooding; wetness.	Severe: very poor traffic-supporting capacity; wetness; subsidence.
Harleston:				
HlA	Moderate: medium bearing capacity; wetness.	Moderate: moderate permeability.	Moderate: wetness	Moderate: fair traffic-supporting capacity; wetness.
HlB	Moderate: medium bearing capacity; wetness.	Moderate: moderate permeability.	Moderate: wetness	Moderate: fair traffic-supporting capacity; wetness.
Hyde: Hy	Severe: wetness; flooding.	Slight	Severe: moderately slow permeability; wetness.	Severe: wetness
Jena. Mapped only with Nugent soils.	Slight. Severe in areas subject to flooding.	Moderate to severe: moderate to moderately rapid permeability; fair site material. Severe if floodwaters are deep.	Slight. Severe in areas subject to flooding.	Slight. Severe in areas subject to flooding.
Lakeland: Lr	Slight	Severe: rapid permeability.	Slight: possible contamination of shallow water supplies.	Slight
Latonia: Lt	Slight	Severe: moderately rapid permeability.	Slight	Slight

See footnote at end of table.

for town and country planning

in such mapping units may have different properties and limitations, and for this reason it is necessary to follow carefully the instructions appear in the first column of this table]

Commercial buildings and light industries	Sanitary landfill [1]	Camp areas	Picnic areas	Playgrounds	Paths and trails
Severe: wetness; high corrosivity of uncoated steel.	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Moderate: wetness; medium bearing capacity.	Severe: wetness	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Slight	Moderate: loamy sand.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.
Severe: slope	Moderate: loamy sand.	Moderate: loamy sand surface layer.	Moderate: loamy sand surface layer.	Severe: slope	Moderate: loamy sand surface layer.
Severe: very low bearing capacity; flooding; wetness; subsidence.	Severe: wetness; flooding; very poor traffic-supporting capacity.	Severe: wetness; flooding; organic surface layer.	Severe: wetness; flooding; organic surface layer.	Severe: wetness; flooding; organic surface layer.	Severe: wetness; flooding; organic surface layer.
Moderate: medium bearing capacity; wetness.	Severe: wetness	Slight	Slight	Slight	Slight.
Moderate: medium bearing capacity; wetness.	Severe: wetness	Slight	Slight	Moderate: slope	Slight.
Severe: wetness; flooding.	Severe: wetness	Severe: wetness; moderately slow permeability.	Severe: wetness	Severe: wetness; moderately slow permeability.	Severe: wetness.
Slight. Severe if subject to flooding.	Slight. Severe if subject to flooding.	Slight. Severe in areas subject to flooding during season of use.	Slight. Severe in areas subject to flooding during season of use.	Slight. Severe in areas subject to flooding during season of use.	Slight. Severe in areas subject to flooding during season of use.
Moderate: medium bearing capacity.	Severe: rapid permeability; possible contamination of shallow water supplies.	Severe: fine sand surface layer.	Severe: fine sand surface layer.	Severe: fine sand surface layer.	Severe: fine sand surface layer.
Slight	Severe: moderately rapid permeability; contamination of shallow water supplies.	Slight	Slight	Slight	Slight.

TABLE 9.—*Degree and kind of soil limitations*

Soil series and map symbols	Dwellings without basements	Sewage lagoons	Septic tank absorption fields	Local roads and streets
McLaurin:				
MlB	Slight	Severe: moderate to moderately rapid permeability.	Slight	Slight
MlC	Moderate: slopes	Severe: moderate to moderately rapid permeability.	Slight	Slight
Nahunta: Nh	Moderate: wetness; medium bearing capacity.	Slight	Severe: moderately slow permeability; wetness.	Moderate: wetness; fair traffic-supporting capacity.
*Nugent: Nu. For Jena part of Nu, refer to Jena series.	Severe: flooding	Severe: moderately rapid permeability.	Severe: flooding	Severe: flooding
Ocilla: Oc	Moderate: wetness	Moderate: moderate permeability.	Severe: wetness	Moderate: wetness
Plummer: Pm	Severe: wetness; flooding.	Moderate: seepage	Severe: wetness; flooding.	Severe: wetness; flooding.
Poarch:				
PoA	Moderate: medium bearing capacity.	Moderate: permeability is moderate above 5 feet and moderately slow below.	Moderate: permeability is moderate at depths above 5 feet and moderately slow below.	Slight
PoB	Slight to moderate: medium bearing capacity.	Moderate: slope; moderate permeability above 6 feet.	Moderate: moderate permeability at depths above 6 feet.	Slight
PoC	Slight to moderate: medium bearing capacity.	Severe: slope	Moderate: moderate permeability at depths above 6 feet.	Moderate: slope
Poarch part of EuE	Moderate: slope; medium bearing capacity.	Severe: slope	Moderate: moderate permeability at depths above 6 feet.	Moderate: slope
*Ponzer: Ps. For Smithton part of Ps, refer to Smithton series.	Severe: wetness; low bearing capacity; flooding.	Severe: organic matter content.	Severe: wetness; flooding.	Severe: wetness; flooding; poor traffic-supporting capacity.
Ruston:				
RuA	Slight	Moderate: moderate permeability.	Slight	Slight
RuB	Slight	Moderate: moderate permeability.	Slight	Slight
RuC	Slight	Moderate: moderate permeability.	Moderate: slope	Slight
RuD	Moderate: slope	Severe: slope	Moderate: slope	Moderate: slope

See footnote at end of table.

for town and country planning—Continued

Commercial buildings and light industries	Sanitary landfill [1]	Camp areas	Picnic areas	Playgrounds	Paths and trails
Slight	Slight	Slight	Slight	Moderate: slope	Slight.
Moderate: slope	Slight	Slight	Slight	Moderate if slope is less than 6 percent; severe if more than 6 percent.	Slight.
Moderate: wetness; medium bearing capacity.	Severe: wetness	Severe: wetness	Moderate: wetness	Severe: wetness	Moderate: wetness.
Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding	Severe: flooding.
Moderate: wetness	Severe: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness	Moderate: wetness.
Severe: wetness; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding.
Moderate: medium bearing capacity.	Slight	Slight	Slight	Slight	Slight.
Moderate: medium bearing capacity.	Slight	Slight	Slight	Moderate: slope	Slight.
Moderate: slope; medium bearing capacity.	Slight	Slight. Moderate where slopes are more than 8 percent.	Slight. Moderate where slopes are more than 8 percent.	Severe: slope	Slight.
Severe: slope; medium bearing capacity.	Slight	Moderate: slope	Moderate: slope	Severe: slope	Slight to moderate: slope.
Severe: wetness; low bearing capacity; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding.	Severe: wetness; flooding.
Slight	Slight	Slight	Slight	Slight	Slight.
Slight	Slight	Slight	Slight	Moderate: slope	Slight.
Moderate: slope	Slight	Slight	Slight	Severe: slope	Slight.
Severe: slope	Slight	Moderate: slope	Moderate: slope	Severe: slope	Slight.

TABLE 9.—*Degree and kind of soil limitations*

Soil series and map symbols	Dwellings without basements	Sewage lagoons	Septic tank absorption fields	Local roads and streets
*Saucier: SfB	Moderate: wetness; medium bearing capacity; slope.	Moderate: slope	Severe: slow permeability in lower part.	Moderate: fair traffic-supporting capacity.
SfC	Moderate: wetness; medium bearing capacity.	Moderate: slope	Severe: slow permeability in lower part.	Moderate: fair traffic-supporting capacity; slope.
ShC, SnB. For Smithton and Susquehanna parts of ShC, refer to Smithton and Susquehanna series. For Susquehanna part of SnB, refer to Susquehanna series.	Moderate: wetness; slope; medium bearing capacity.	Moderate to severe: slope.	Severe: slow permeability in lower part.	Moderate: fair traffic-supporting capacity; slope.
Smithdale: SsE	Severe: slope	Severe: slope	Moderate: slope	Moderate: slope
Smithton: St	Severe: wetness	Slight to moderate: moderate to moderately slow permeability.	Severe: moderately slow permeability; wetness.	Severe: wetness
St. Lucie: Su, Sv	Slight	Severe: very rapid permeability.	Slight: possible contamination of shallow water supplies.	Slight
Sulfaquepts: Sw	Moderate: medium bearing capacity.	Severe: rapid permeability.	Severe: wetness	Moderate: wetness
Susquehanna part of ShC.	Severe: high shrink-swell potential; wetness.	Moderate to severe: slope.	Severe: very slow permeability; wetness.	Severe: high shrink-swell potential; low strength and stability.
Susquehanna part of SnB.	Severe: high shrink-swell potential; wetness.	Moderate: slope	Severe: very slow permeability; wetness.	Severe: high shrink-swell potential; low strength and stability

[1] Onsite study is needed of the underlying strata and water table to determine the hazards of aquifer pollution and drainage into ground water in landfill deeper than 5 or 6 feet.

for town and country planning—Continued

Commercial buildings and light industries	Sanitary landfill [1]	Camp areas	Picnic areas	Playgrounds	Paths and trails
Moderate to severe: medium to low bearing capacity; high corrosivity of uncoated steel; wetness.	Moderate: wetness; lower part of subsoil is clay.	Slight	Slight	Moderate: slope	Slight.
Moderate to severe: medium bearing capacity; high corrosivity of uncoated steel; wetness.	Moderate: wetness; lower part of subsoil is clay.	Slight	Slight	Severe: slope	Slight.
Severe: slope; medium bearing capacity; high corrosivity of uncoated steel; wetness.	Moderate: slope; lower part of subsoil is clay; wetness.	Moderate: slope	Moderate: slope	Severe: slope	Slight.
Severe: slope	Moderate: slope	Moderate: slope	Moderate: slope	Severe: slope	Slight to moderate: slope.
Severe: wetness; high corrosivity of uncoated steel.	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness	Severe: wetness.
Slight	Severe: sand, very rapid permeability.	Severe: sand surface.	Severe: sand surface.	Severe: sand surface.	Severe: sand surface.
Severe: wetness	Severe: wetness	Severe: sand surface.	Severe: sand surface.	Severe: sand surface.	Severe: sand surface.
Severe: high shrink-swell potential; wetness.	Severe: clay subsoil; slope.	Moderate: very slow permeability; wetness; slope.	Moderate: wetness	Severe: slope	Moderate: wetness.
Severe: high shrink-swell potential; wetness.	Severe: subsoil is clay; wetness.	Moderate: very slow permeability; wetness.	Moderate: wetness	Moderate: very slow permeability.	Moderate: wetness.

Moderate limitations can be overcome or modified with planning, design, or special maintenance.

Severe limitations are difficult and costly to modify or overcome; they require major soil reclamation, special design, or intense maintenance.

In the following paragraphs the terms used in the table are defined and the basis for the ratings is explained.

Dwellings refer to houses and other buildings not more than three stories high. The type of sewage disposal system is not considered in the evaluation. Intensive site preparation generally is required.

Soil factors considered in ratings for dwellings are wetness, flooding, shrink-swell potential, bearing capacity, and slope.

Sewage lagoons are embanked ponds used to hold sewage for the time required for bacterial decomposition. Properties that affect the pond floor and the stability of the embankment are considered. Among them are soil texture, erodibility, permeability (fig. 15), organic-matter content, slope, and flood hazard. The assumption is that the embankment is compacted to medium density and the pond is protected from flooding. Further, the depth is less than 5 feet and floods of low velocity are not limiting.

Septic tank absorption fields are systems of subsurface tile lines that distribute effluent from a septic tank into the natural soil. The soil material between depths of 18 and 72 inches is evaluated. Permeability, depth to a water table (fig. 16), flood hazard, slope, and other properties that affect the absorption of effluent and the construction and operation of the tile system are considered.

Local roads and streets are trafficways that consist of (1) underlying soil material (either cut or fill) called subgrade; (2) base material of gravel, crushed rock or lime, or cement-stabilized soil called subbase; and (3) the actual road surface or pavement. Properties that affect design and construction are traffic-supporting capacity and stability of the subgrade, shrink-swell potential, wetness, flooding, and slope.

Commercial buildings and light industries refer to structures no higher than three stories. Ratings are based on a public or community sewer system being available. Bearing capacity and settlement under load are soil features that affect design, construction costs, and excavations. Other soil properties considered are wetness, flooding, density, plasticity, texture, shrink-swell potential, and slope.

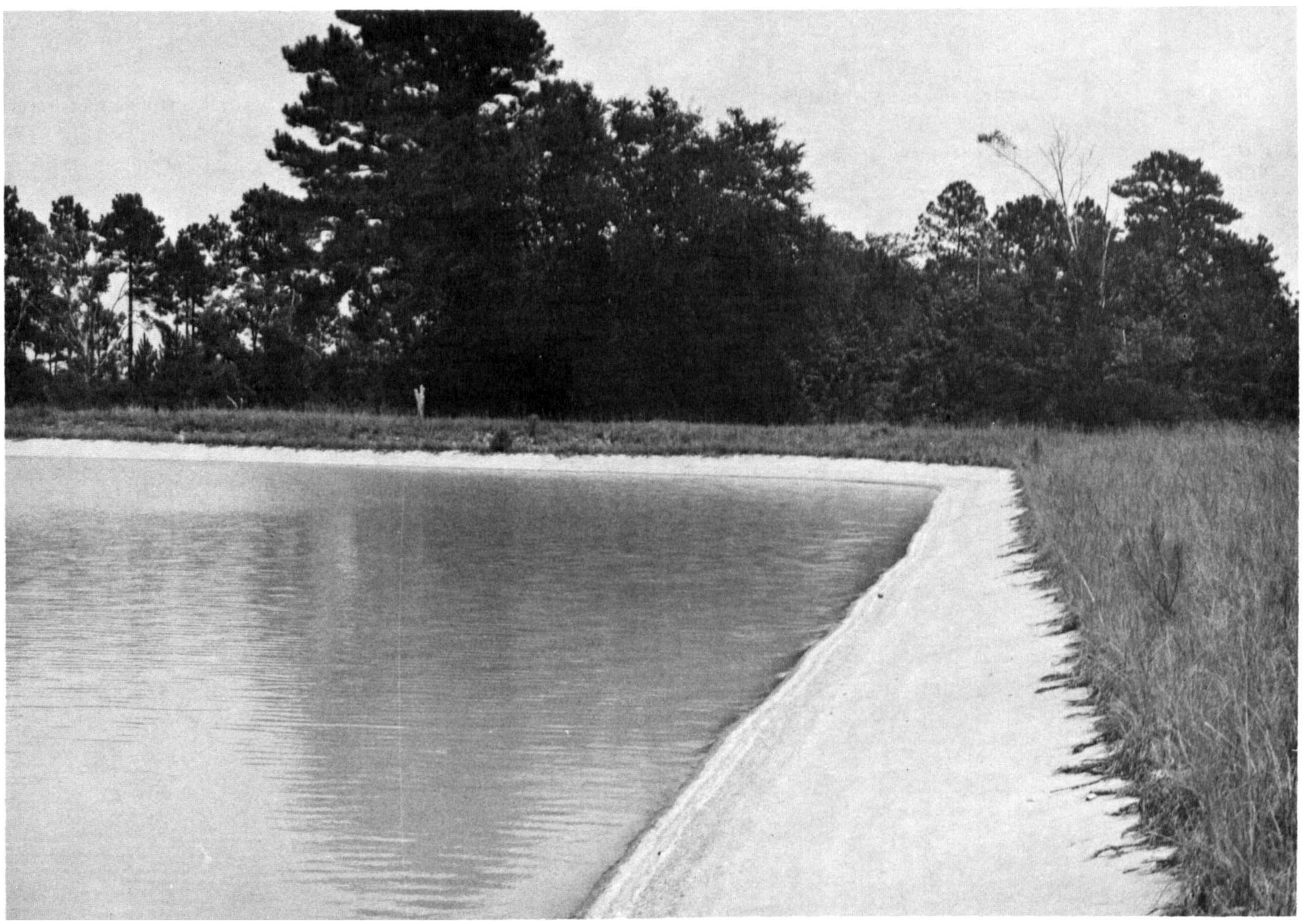

***Figure 15.*—A concrete-lined sewage lagoon on Harleston fine sandy loam, 2 to 5 percent slopes. The lining is needed because the soil is too permeable for this use.**

***Figure 16.*—Atmore silt loam used as a septic tank absorption field, which does not function properly on this poorly drained, slowly permeable soil that has a water table at or near the surface during wet periods.**

Sanitary landfills are disposal areas for such household refuse as garbage and rubbish. The excavations are trenches that are wide enough and long enough to accommodate refuse from the source for a determined time. They are sometimes 15 feet deep or more and require geological investigations to prevent ground water pollution. The refuse is dumped into the trenches, compacted, and covered with about 6 inches of soil each day. This is repeated until the trench is filled. Covering the refuse daily eliminates breeding places for flies, rats, or other disease-bearing animals and insects. Finally the trench is covered with soil sufficiently thick, generally 2 feet or more, to insure sanitary conditions and to support vegetation.

Soil factors considered for these ratings include wetness, flooding, traffic-supporting capacity, soil texture, permeability, and slope.

Camp areas are areas for temporary living out-of-doors in tents, pickup campers, or camping trailers. Site preparation normally includes clearing an area for tents and an area for parking cars and trailers. Soils for camp areas should be well suited to heavy vehicle and pedestrian traffic during the period May through September.

Soil features considered in these ratings are wetness, flooding, surface layer texture, permeability, and slope.

Picnic areas, where a meal is eaten out-of-doors, can be expected to be used to some degree throughout the year. The soils should support heavy pedestrian traffic. Site preparation is required for the placement of picnic tables and grills.

Soil features considered in these ratings are mainly wetness, flooding, texture of surface layer, and slope.

Playgrounds are areas used for children's playground equipment and for baseball, softball, tennis, archery, target and skeet shooting, and other group or competitive sports. Site preparation, such as clearing, grading, shaping, and draining, may be required where relatively large areas are used for these activities.

Soil features considered in these ratings are mainly wetness, flooding, texture of surface layer, permeability, and slope.

Paths and trails are used for hiking, horseback riding, and bicycling. Selection of sites for these activities is largely influenced by their condition as they occur in nature. However, site preparation that includes some clearing and minor cuts and fills commonly is needed.

Soil features considered in these ratings are wetness, flooding, texture of surface layer, and slope.

Formation and Classification of the Soils

This section tells how the major factors of soil formation have affected the soils in Harrison County and describes how soil horizons develop. The current system of soil classification is explained, and the soil series in the county are placed in this sytem.

Factors of Soil Formation

Soil is the product of soil-forming processes acting on accumulated or deposited geologic materials. The five major factors in soil formation are parent material, climate, plants and animals, topography, and time. Climate and living organisms are the active forces of soil formation. Their effect on parent material is modified by relief and by the length of time the parent material has been in place. The relative importance of each factor differs from place to place, but normally all the factors affect the formation of soils.

Parent material

Parent material is the unconsolidated geologic material in which a soil develops. It largely determines the chemical and mineral composition of the soils.

Most of the soils in Harrison County formed in unconsolidated beds of fine-textured to coarse-textured Coastal plain sediments (*3*). Some soils formed in alluvium; other soils formed in deposits of highly decomposed herbaceous plant remains adjoining salt or brackish water and periodically flooded by high tides. Coastal beach sands were deposited by the action of the tides, waves, and currents of the sea. Other soils formed in hummocks of sand blown from sand beaches on offshore islands.

The bright-colored soils of Harrison County developed from material that, during the period of soil development, was above the ground-water level and was subjected to the

influence of water that percolated through it from the surface. The grayish colored soils are on low, flat areas where the water table is high and the drainage is poor.

Soils that formed in place from Coastal plain sediments occur throughout the county. These sediments consist of sand, silt, and clay. Slopes are nearly level through steep.

Soils that formed in alluvium washed from upland soils occur along the larger streams in the county. They are dominantly of sandy texture. Soils on first bottoms have a weakly defined profile because floodwaters still deposit fresh soil material.

Coastal beach consists of sands deposited by tides, currents, and wave action of the Gulf of Mexico.

Soils that formed in hummocks of sand blown from the coastal beaches on offshore islands occur on the inland side of the beaches, and downwind. Textures are sands.

Soils that formed in organic materials are adjoining salt or brackish water at low elevations. These areas are coastal marshes. A water table at or near the surface almost continuously retards decomposition of the grassy vegetation, which is still actively depositing more fibrous organic material in these areas. These areas are frequently flooded with tidewater, and the reaction and content of soluble salts are about like that which would be expected from flooding with seawater. Subsequent flooding does not completely remove the concentrations of soluble salts and bases left by previous cyclic combinations of tide and evaporation.

Climate

The warm, moist climate in Harrison County has favored the rapid development of soils. Warm temperatures accelerate the growth of many kinds of organisms and the rate of physical and chemical changes in the soils. High precipitation has leached bases and other soluble material and has carried colloidal particles and other less soluble material downward through the profile. For more information about the climate of Harrison County, refer to the section "Environmental Factors Affecting Use of the Soil."

Plants and animals

Micro-organisms, earthworms, plants, and animals that live on and in the soil are important in the formation of soils. Bacteria, fungi, and other micro-organisms help weather rock and decompose organic matter. They are mostly in the uppermost few inches of the soil. Earthworms and other small invertebrates are mostly in the surface layer. On wetter soils, numerous crawfish dig into the subsoil. Together, they continually mix the soil material. Plants alter the soil microclimate, supply organic matter, and transfer minerals from the subsoil to the surface layer.

The native vegetation of the well-drained uplands was mainly longleaf and slash pines. On the broad wet flats, it was mainly loblolly and slash pines, sweetgum, and sweetbay. The better drained bottom lands supported loblolly, slash, and spruce pines; oak; magnolia; holly; and beech. Nearly level soils supported oak, bay, hickory, blackgum, and swamp blackgum, in addition to the species named above. Native vegetation in old sloughs and depressions included tupelo, gum, cypress, bay, and magnolia trees.

Topography

Topography, or relief, affects soil formation through its influence on drainage, erosion, vegetation, and soil temperature. Slopes in the county range from nearly level to steep. Differences in slope affect the characteristics of the soils. For example, both McLaurin and Atmore soils formed in loamy Coastal plain material, but the McLaurin soils are on ridges and the Atmore soils are on nearly level low flats. The McLaurin soils are well drained and have a yellowish-red upper part of the subsoil and a red lower part. In contrast, the Atmore soils are poorly drained and have a fluctuating water table, a grayish upper part of the subsoil, and a mottled gray, brown, and red lower part of the subsoil, which contains soft plinthite.

Time

Generally, a long time is required for the formation of distinct horizons in soils. Young soils commonly have developed very little, and older soils have well-defined horizons. For example, young soils that have a weakly developed profile retain most of the characteristics of the sandy parent material except for the darkening of the surface layer. Eustis soils are older than Nugent soils and have distinctly developed horizons. Although they formed in material similar to that of the Nugent soils, Eustis soils have a profile quite distinct from the parent material.

Processes of Soil Formation

The main processes involved in the formation of horizons are (1) the accumulation of organic matter, (2) the leaching of calcium carbonates and bases, (3) the formation and translocation of silicate clay, and (4) the reduction, segregation, and transfer of iron.

Accumulation of organic matter in the upper part of the soil profile contributes to the formation of an A1 horizon. The soils in Harrison County have generally low to very high organic-matter content.

Carbonates and bases have been leached from nearly all the soils. Most are moderately to strongly leached. Leaching of bases from the upper horizons of a soil commonly precedes the translocation of silicate clay.

Translocation of silicate clay has occurred in many of the soils. Translocation of clay minerals contributes to the development of an eluviated A2 horizon that contains less clay and is generally lighter in color than the B horizon. The B horizon commonly has clay accumulated in films, in pores, and on the surface of peds. Ruston soils, for example, have films of translocated clay in the B horizon.

Reduction, segregation, and transfer of iron, a process called gleying, is evident in the poorly drained soils of the county. Reduction and loss of iron are indicated by gray colors in the subsoil. Segregation of iron is indicated by reddish-brown mottles and concretions.

Classification of the Soils

Classification consists of an orderly grouping of soils according to a system designed to make it easier to remember soil characteristics and interrelationships. Classification is useful in organizing and applying the results of experience and research. Soils are placed in narrow classes

TABLE 10.—*Soil series classified according to the current classification system*

Series	Family	Subgroup	Order
Atmore	Coarse-loamy, siliceous, thermic	Plinthic Paleaquults	Ultisols.
Escambia	Coarse-loamy, siliceous, thermic	Plinthaquic Paleudults	Ultisols.
Eustis	Sandy, siliceous, thermic	Psammentic Paleudults	Ultisols.
Handsboro	Euic, thermic	Typic Sulfihemists	Histosols.
Harleston	Coarse-loamy, siliceous, thermic	Aquic Paleudults	Ultisols.
Hyde [1]	Fine-loamy, mixed, thermic (siliceous)	Umbric Paleaquults	Ultisols.
Jena	Coarse-loamy, siliceous, thermic	Fluventic Dystrochrepts	Inceptisols.
Lakeland	Siliceous, thermic, coated	Typic Quartzipsamments	Entisols.
Latonia	Coarse-loamy, siliceous, thermic	Typic Hapludults	Ultisols.
McLaurin	Coarse-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Nahunta	Fine-silty, siliceous, thermic	Aeric Paleaquults	Ultisols.
Nugent	Sandy, siliceous, thermic	Typic Udifluvents	Entisols.
Ocilla	Loamy, siliceous, thermic	Aquic Arenic Paleudults	Ultisols.
Plummer	Loamy, siliceous, thermic	Grossarenic Paleaquults	Ultisols.
Poarch	Coarse-loamy, siliceous, thermic	Plinthic Paleudults	Ultisols.
Ponzer [2]	Loamy, mixed, dysic, thermic	Terric Medisaprists	Histosols.
Ruston	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Saucier	Fine-loamy, siliceous, thermic	Plinthaquic Paleudults	Ultisols.
Smithdale	Fine-loamy, siliceous, thermic	Typic Paleudults	Ultisols.
Smithton	Coarse-loamy, siliceous, thermic	Typic Paleaquults	Ultisols.
St. Lucie	Siliceous, hyperthermic, uncoated	Typic Quartzipsamments	Entisols.
Sulfaquepts	(3)	(3)	Inceptisols.
Susquehanna	Fine, montmorillonitic, thermic	Vertic Paleudalfs	Alfisols.

[1] These soils are taxadjuncts to the Hyde series. They are similar in morphology, behavior, and use, but have siliceous mineralogy rather than mixed mineralogy.
[2] These soils are taxadjuncts to the Ponzer series. They are similar in morphology, behavior, and use, but have siliceous mineralogy.
[3] Not classified.

for discussion in detailed soil surveys and for application of knowledge within farms and fields. The many thousands of narrow classes are then grouped into progressively fewer and broader classes in successively higher categories, so that information can be applied to large geographic areas.

Two systems of classifying soils have been used in the United States in recent years. The older system was adopted in 1938 and revised later (*10*). The system currently used by the National Cooperative Soil Survey was developed in the early sixties and was adopted in 1965 (*12*). It is under continual study.[8]

The current system of classification has six categories. Beginning with the most inclusive, these categories are the order, suborder, the great group, the subgroup, the family, and the series. The criteria for classification are soil properties that are observable or measurable, but the properties are selected so that soils of similar genesis are grouped together. The placement of some soil series in the current system of classification, particularly in families, may change as more precise information becomes available.

Table 10 shows the classification of the soil series of Harrison County by family, subgroup, and order, according to the current system.

ORDER.—Ten soil orders are recognized in the current system. They are Entisols, Vertisols, Inceptisols, Aridisols, Mollisols, Spodosols, Alfisols, Ultisols, Oxisols, and Histosols. The properties used to differentiate the soil orders are those that tend to give broad climatic groupings of soils. Two exceptions are the Entisols and Histosols, which occur in many different climates.

[8] See the unpublished working document "Selected Chapters from the Unedited Text of the Soil Taxonomy" available in the SCS State Office, Jackson, Mississippi.

Five soil orders are represented in Harrison County—Entisols, Inceptisols, Ultisols, Alfisols, and Histosols. Entisols are recent soils that do not have genetic horizons or have only the beginnings of such horizons. Inceptisols most often occur on young, but not recent, land surfaces. Ultisols have a clay-enriched B horizon that has less than 35 percent base saturation; the base saturation decreases with depth. Alfisols are soils containing clay-enriched B horizons that have high base saturation. Histosols are soils that are dominantly organic.

SUBORDER.—Each order is divided into suborders, primarily on the basis of those soil characteristics that produce classes having the greatest genetic similarity. The suborders narrow the broad climatic range permitted in the orders. The soil properties used to separate suborders mainly reflect either the presence or absence of waterlogging or soil differences resulting from the climate or vegetation.

GREAT GROUPS.—Soil suborders are separated into great groups on the basis of uniformity in the kinds and sequence of major soil horizons and features. The horizons used to make separations are those in which clay, iron, or humus have accumulated. The features considered are the self-mulching properties of clay, soil temperature, and major differences in chemical composition (mainly calcium, magnesium, sodium, and potassium). The great group is not shown in table 10 because it is the last part of the name of the subgroup.

SUBGROUPS.—Each great group is separated into subgroups, one representing the central (typic) segment of the group, and others, called intergrades, that have properties of one great group and also one or more properties of another great group, suborder, or order. Subgroups may also be made in those instances where soil properties inter-

grade outside the range of any other great group, suborder, or order. The names of subgroups are derived by placing one or more adjectives before the name of the great group. An example is Typic Hapludults.

FAMILIES.—Families are separated within a subgroup primarily on the basis of properties important to the growth of plants or to the behavior of soils in engineering uses. Among the properties considered are texture, mineral composition, reaction, soil temperature, permeability, thickness of horizons, and consistence. An example of a family is the fine-loamy, siliceous, thermic family of Typic Paleudults.

SERIES.—As explained in the section "How This Survey Was Made," the series is a group of soils having major horizons that, except for texture of surface layer, are similar in important characteristics and in arrangement in the profile. The soil series generally is given the name of the geographic location near the place where a soil of that series was first observed and mapped. An example is the Saucier series.

Laboratory Data

Laboratory data for Atmore, Escambia, and Poarch soils are given in tables 11, 12, 13, 14, and 15. The Escambia and Poarch soils were sampled in 1967, and the Atmore soils were sampled in 1968. The samples were analyzed at the Soil Survey Laboratory at Beltsville, Md. Tables 11 and 12 give the physical properties of the soils, table 13 gives the chemical properties, table 14 gives the approximate mineral composition of the clay, and table 15 gives the mineral composition of a portion of the sand and silt by microscopic grain studies. The information in these tables is useful to soil scientists in classifying soils, and in developing concepts of soil genesis. It is also helpful in estimating available water capacity, fertility, and other properties that affect soil management.

The methods of sampling and analysis are described in the following paragraphs.

Three samples were collected from pits at different locations in Harrison County. The samples were air dried, quartered, and subsampled. The subsample is crushed carefully with a wooden rolling pin, and care is taken to avoid crushing soft rock. The sample is screened through a 2 millimeter round-hole sieve. All determinations, except for bulk density and 1/3 atmosphere water content, are made on the material finer than 2 millimeters, or the fine-earth fraction. A small sample is ground to approximately 0.25 millimeter for organic carbon and total nitrogen determination. The results are reported on an oven-dry basis.

Standard methods of Soil Survey Laboratory were used to obtain the data. Determinations of clay size classes were made by the pipette method, using sodium hexametaphosphate and overnight shaking for dispersion (*5*). Coarse fragments are reported as percent of the weight of material finer than 76 millimeters. Bulk density measurements were

TABLE 11.—*Some physical*

[Soils analyzed at the Soil Survey Laboratory, Soil Conservation

Soil	Horizon	Depth	Size class and diameter of particles		
			Total sand (2.0 to 0.05 mm.)	Total silt (0.05 to 0.002 mm.)	Total clay (less than 0.002 mm.)
		Inches	*Percent*	*Percent*	*Percent*
Atmore silt loam; S68 Miss-24-1 (1 to 7): 68B243 to 68B249.	A1	0-5	35.6	58.9	5.5
	A21g	5-9	34.3	59.1	6.6
	A22g&B	9-30	30.8	60.7	8.5
	B21tg	30-39	29.2	58.9	11.9
	B22tg	39-51	26.4	52.1	21.5
	B23tg	51-59	32.7	25.4	41.9
	B24tg	59-78	43.3	22.7	34.0
Escambia silt loam; S67 Miss-24-3 (1 to 8): 67B437-67B444.	A1	0-4	39.1	55.2	5.7
	A2	4-16	38.3	54.2	7.5
	B21t	16-25	31.2	53.1	15.7
	B22t	25-35	30.3	51.5	18.2
	B23t	35-47	30.7	41.3	28.0
	B24t	47-59	31.6	38.9	29.5
	B25t	59-73	31.6	37.1	31.3
	B3t	73-87	35.6	29.5	34.9
Poarch fine sandy loam; S67 Miss-24-2 (1 to 9): 67B427-67B435.	Ap	0-5	73.1	20.1	6.8
	B21t	5-11	64.2	24.1	11.7
	B22t	11-24	64.0	24.2	11.8
		24-35	69.7	19.6	10.7
	B23t	35-43	72.5	16.7	10.8
	B24t	43-52	71.1	15.0	13.9
	B25t	52-59	71.4	11.8	16.8
	B26t	59-73	73.2	9.6	17.2
	B27t	73-84	68.6	7.3	24.1

made on clods at two different moisture levels—at ⅓ bar (field capacity) and at oven dryness. To determine bulk density at ⅓ bar, saran-coated clods were saturated and desorbed under ⅓ bar suction, after which their volume was determined.

The bulk density at oven-dry water content is calculated from the oven-dry volume of the clod used in the bulk density determination at ⅓ bar. Bulk density values are corrected for the material coarser than 2 millimeters and represent the bulk density of the fine-earth fabric (*2*).

Water content at ⅓ bar suction is determined as part of the bulk density determinations. Values reported are for the material finer than 2 millimeters. Water content at 15 atmospheres suction is determined with pressure-membrane apparatus on sieved samples (*9*). Available water capacity is computed as the difference in water content of soil between ⅓ bar and 15 bar suction multiplied by the ⅓ bar bulk density and Cm (the coarse-fragment conversion factor), and divided by 100. This provides available water values on a volume basis.

Organic carbon content is determined by a wet combustion method, using a sulfuric acid and potassium dichromate mixture, and back titration of excess dichromate with ferrous sulfate. It is assumed that 1 milliequivalent potassium dichromate is equivalent to 3.9 milligrams carbon (*8*).

Total nitrogen is determined by semimicro Kjeldahl method, using a digestion mix of potassium sulfate and concentrated sulfuric acid with selenium metal and copper sulfate as catalysts. Ammonia is distilled with steam, collected in boric acid, and titrated with standardized sulfuric acid. The pH determinations were measured with a pH meter using a glass electrode and a 1:1 ratio of soil to 1N potassium chloride and a 1:1 ratio of soil and water.

Extractable bases are determined by leaching soil with neutral-normal ammonium acetate (*8*).

Extractable calcium, magnesium, sodium, and potassium were determined by atomic absorption.

Extractable acidity is determined by leaching soil in sulfur tubes with barium chloride triethanolamine solution at pH 8.2, and back titration of excess triethanolamine with standard hydrochloric acid (*8*).

Extractable aluminum is measured by leaching soil with 1N potassium chloride solution, and the aluminum measured by a potassium fluoride titration (*14*).

Percentage base saturation is the percent that extractable bases are of the cation exchange capacity, by the sum of the cations.

To determine clay mineralogy, soil is treated with hydrogen peroxide to remove organic matter, and this is followed by a dithionate treatment to remove iron. The sample is dispersed with hexametaphosphate, and the material finer than 2 microns is separated by centrifugation and decantation.

In the X-ray analysis, a parallel oriented, magnesium saturated specimen with and without ethylene glycol solvation and a potassium saturated specimen unheated, heated

properties of selected soils

Service, Beltsville, Md. Dashes indicate value not determined]

Textural class	Cm	Bulk density		Coefficient of linear extensibility (COLE)	Moisture held at a tension of—		Available water capacity
		At ⅓ bar water content	Oven dry		⅓ bar	15 bars	
		Gm./cc.	Gm./cc.		Percent	Percent	Inches/inch of soil
Silt loam	1.00	1.33	1.35	0.005	22.3	4.1	0.24
Silt loam	1.00	1.42	1.44	.005	20.2	3.8	.23
Silt loam	1.00	1.59	1.62	.006	18.6	4.6	.22
Silt loam	1.00	1.54	1.58	.009	20.3	6.0	.22
Loam	1.00	1.55	1.63	.017	21.8	10.0	.08
Clay	1.00	1.53	1.70	.036	25.0	17.9	.11
Clay loam	1.00	1.61	1.72	.022	21.4	13.7	.12
Silt loam	1.00	1.21	1.24	.008	28.3	5.1	.28
Very fine sandy loam	.99	1.56	1.58	.002	17.8	3.7	.22
Very fine sandy loam	.99	1.59	1.60	.002	18.1	7.3	.17
Loam	.98	1.53	1.56	.006	20.0	8.1	.18
Loam	1.00	1.64	1.69	.010	19.0	12.3	.11
Loam	1.00	1.68	1.72	.008	18.9	12.0	.11
Clay loam	1.00	1.63	1.70	.013	20.1	12.9	.11
Clay loam	----------	----------	----------	----------	----------	13.4	----------
Fine sandy loam	.99	1.51	1.53	.005	12.0	4.7	.11
Fine sandy loam	1.00	1.60	1.63	.005	12.4	4.9	.12
Fine sandy loam	.99	1.68	1.70	.005	12.3	5.0	.12
Fine sandy loam	.99	1.66	1.70	.007	12.3	4.4	.13
Fine sandy loam	.99	1.65	1.67	.005	13.8	4.5	.15
Fine sandy loam	.99	1.66	1.68	.004	13.2	5.8	.12
Fine sandy loam	.99	1.75	1.77	.004	12.5	7.3	.09
Fine sandy loam	.99	1.75	1.77	.003	13.3	7.5	.10
Sandy clay loam	----------	----------	----------	----------	----------	10.8	----------

TABLE 12.—*Size classes of silts, sands,*

[Soils analyzed at the Soil Survey Laboratory, Soil Conservation

Soil	Horizon	Depth	Size class and diameter of particles			
			Very coarse sand (2.0–1.0 mm.)	Coarse sand (1.0–0.5 mm.)	Medium sand (0.5–0.25 mm.)	Fine sand (0.25–0.1 mm.)
		Inches	*Percent*	*Percent*	*Percent*	*Percent*
Atmore silt loam: S68 Miss–24–1 (1 to 7); 68B243 to 68B249	A1	0–5	0	0. 3	1. 4	15. 4
	A21g	5–9	. 2	. 3	1. 5	14. 8
	B22g&B	9–30	[2] . 3	[2] . 3	[2] 1. 6	12. 8
	B21tg	30–39	[2] . 1	[2] . 3	[2] 2. 2	12. 4
	B22tg	39–51	. 0	[2] . 2	[2] 1. 6	10. 8
	B23tg	51–59	[3] 1. 4	[3] . 4	[3] 3. 4	[4] 14. 0
	B24tg	59–78	[4] . 2	[4] . 5	3. 7	23. 1
Escambia silt loam: S67 Miss–24–3 (1 to 8); 67B437 to 67B444	A1	0–4	. 3	. 6	1. 8	13. 2
	A2	4–16	. 4	. 7	2. 4	13. 2
	B21t	16–25	. 2	. 6	2. 3	10. 4
	B22t	25–35	. 2	. 5	2. 0	10. 3
	B23t	35–47	. 4	1. 1	2. 1	10. 6
	B24t	47–59	. 2	. 5	2. 1	10. 8
	B25t	59–73	. 0	. 4	2. 4	11. 2
	B3t	73–87	. 0	. 5	3. 2	14. 3
Poarch fine sandy loam: S67 Miss–24–1 (1 to 9); 67B427 to 67B435	Ap	0–5	. 2	3. 1	15. 5	42. 0
	B21t	5–11	. 1	2. 5	12. 9	37. 2
	B22t	11–24	. 2	2. 7	12. 8	37. 0
		24–35	. 2	2. 7	12. 9	40. 7
	B23t	35–43	. 3	2. 4	13. 5	43. 3
	B24t	43–52	. 1	2. 6	14. 1	42. 2
	B25t	52–59	. 4	2. 9	14. 5	43. 4
	B26t	59–73	. 2	3. 1	17. 9	43. 6
	B27t	73–84	. 3	3. 8	20. 8	37. 3

[1] Trace.
[2] 0 to 25 percent concretions.
[3] 50 to 100 percent concretions.
[4] 25 to 50 percent concretions.

and coarse fragments for selected soils

Service, Beltsville, Md. Dashes indicate value not determined]

Size class and diameter of particles—Continued							
Very fine sand (0.1–0.05 mm.)	Silt (0.05–0.02 mm.)	Smaller than 0.074 mm.	International classification			Coarse fragments	
			I (2.0–0.2 mm.)	II (0.2–0.02 mm.)	III (0.02–0.002 mm.)	Larger than 2 mm., but smaller than 76 mm.	2–19 mm.
Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
18. 5	25. 8	76. 1	17. 1	55. 1	33. 1	0	[1] T
17. 5	26. 0	76. 8	16. 8	54. 0	33. 1	0	T
15. 8	21. 2	79. 3	15. 0	46. 0	39. 5	0	T
14. 2	19. 1	79. 9	15. 0	41. 5	39. 8	0	T
13. 8	20. 2	82. 5	12. 6	41. 3	31. 9	0	T
[4] 11. 5	10. 1	74. 2	21. 2	30. 4	15. 3	0	T
15. 8	11. 3	65. 7	27. 5	41. 3	11. 4	0	T
23. 2	30. 8	---	15. 9	63. 8	24. 4	0	0
21. 6	30. 6	---	16. 7	61. 6	23. 6	2	2
17. 7	26. 2	---	13. 5	51. 1	26. 9	2	2
17. 3	25. 3	---	13. 0	49. 8	26. 2	4	4
16. 5	19. 9	---	14. 2	43. 8	21. 4	0	0
18. 0	19. 3	---	13. 6	45. 1	19. 6	0	0
17. 6	17. 7	---	14. 0	43. 2	19. 4	0	0
17. 6	13. 1	---	18. 0	40. 8	16. 4	---	0
12. 3	8. 0	---	60. 8	42. 6	12. 1	1	1
11. 5	9. 0	---	52. 7	39. 9	15. 1	0	0
11. 3	9. 1	---	52. 7	39. 9	15. 1	1	1
13. 2	8. 2	---	56. 5	43. 2	11. 4	1	1
13. 0	7. 1	---	59. 5	42. 7	9. 6	1	1
12. 1	6. 4	---	59. 0	40. 7	8. 6	1	1
10. 2	4. 9	---	61. 2	36. 8	6. 9	1	1
8. 4	4. 0	---	64. 8	32. 0	5. 6	2	2
6. 4	2. 9	---	62. 2	25. 0	4. 4	---	3

TABLE 13.—*Chemical*

[Soils analyzed at the Soil Survey Laboratory, Soil Conservation

Soil	Horizon	Depth	pH at 1:1 suspension		Organic carbon	Nitrogen	C/N	Extractable iron as Fe
			Potassium chloride	Water				
		Inches			*Percent*	*Percent*		*Percent*
Atmore silt loam: S68 Miss-24-1 (1 to 7); 68B243 to 68B249.	A1	0-5	3.5	3.9	1.42	0.08	18	----------
	A21g	5-9	3.5	3.8	.72	.03	24	----------
	B22g&B	9-30	3.5	3.8	.40	.03	13	----------
	B21tg	30-39	3.4	3.8	.31	----------	----------	----------
	B22tg	39-51	3.6	4.0	.13	----------	----------	----------
	B23tg	51-59	3.7	4.2	.06	----------	----------	----------
	B24tg	59-78	3.6	4.2	.05	----------	----------	----------
Escambia silt loam: S67 Miss-24-3 (1 to 8); 67B437 to 67B444.	A1	0-4	4.0	4.6	1.76	.10	18	0.4
	A2	4-16	4.1	4.8	.29	----------	----------	.5
	B21t	16-25	4.0	4.9	.13	----------	----------	1.1
	B22t	25-35	3.8	4.9	.12	----------	----------	1.6
	B23t	35-47	3.9	4.9	.08	----------	----------	3.8
	B24t	47-59	3.6	4.7	.03	----------	----------	2.6
	B25t	59-73	3.7	4.7	.07	----------	----------	2.2
	B3t	73-87	3.7	4.8	----------	----------	----------	1.5
Poarch fine sandy loam: S67 Miss-24-2 (1 to 9); 67B427 to 67B435.	Ap	0-6	4.9	5.4	1.16	.07	16	.4
	B21t	6-11	4.1	4.8	.22	----------	----------	1.1
	B22t	11-24	4.1	4.9	.05	----------	----------	.9
		24-35	4.0	4.9	----------	----------	----------	.7
	B23t	35-43	4.0	5.3	.02	----------	----------	.6
	B24t	43-52	4.0	4.9	----------	----------	----------	1.0
	B25t	52-59	4.0	4.9	----------	----------	----------	1.5
	B26t	59-73	4.0	4.9	.02	----------	----------	.9
	B27t	73-84	4.0	4.8	.01	----------	----------	1.9

[1] Trace.

properties of selected soils

Service, Beltsville, Md. Dashes indicate value not determined]

Extractable cations (milliequivalents per 100 grams of soil)					Extractable acidity	Cation exchange capacity		Potassium chloride extractable aluminum	Ratios to clay			Base saturation	
Calcium	Magnesium	Sodium	Potassium	Sum		Sum of cations	NH_4OAC		Cation exchange capacity sum	Extractable iron	15 atmospheres water	By sum of cations	By NH_4OAC
												Percent	*Percent*
0.1	0.1	<0.1	<0.1	0.2	8.3	8.5	4.2	1.4	1.54	0.04	0.74	2	5
.1	<.1	<.1	<.1	.1	6.0	6.1	2.9	1.2	.92	.05	.58	2	3
.1	<.1	<.1	<.1	.1	5.6	5.7	2.9	1.9	.67	.05	.54	2	3
.1	.1	<.1	<.1	.2	6.8	7.0	4.0	2.5	.59	.07	.50	3	5
.2	.3	<.1	.1	.6	8.2	8.8	5.8	3.8	.41	.12	.46	7	10
.4	1.0	.1	.2	1.7	15.1	16.8	12.1	7.0	.40	.24	.43	10	14
.5	1.1	.1	.2	1.9	11.5	13.4	10.1	6.0	.39	.10	.40	14	19
.2	.1	.1	.1	.5	7.7	8.2	----------	2.2	1.44	.07	.89	6	----------
------	[1] T	T	T	T	3.7	3.7	----------	1.9	.49	.07	.49	T	----------
------	T	T	T	T	6.8	6.8	----------	3.9	.43	.07	.46	T	----------
------	.1	T	T	.1	6.8	6.9	----------	4.9	.38	.09	.44	1	----------
.1	.2	T	.1	.4	8.3	8.7	----------	7.3	.31	.14	.44	5	----------
.1	.4	T	.1	.6	8.0	8.6	----------	8.1	.29	.09	.41	7	----------
.2	.7	.1	.1	1.1	8.7	9.8	----------	8.6	.31	.07	.41	11	----------
.4	1.2	.1	.2	1.9	9.4	11.3	----------	10.1	.32	.04	.38	17	----------
1.4	.7	T	.2	2.3	3.6	5.9	----------	.1	.87	.06	.69	39	----------
.2	.1	T	.1	.4	3.9	4.3	----------	1.6	.37	.09	.42	9	----------
.2	T	T	.1	.3	4.0	4.3	----------	2.0	.36	.08	.42	7	----------
.1	T	T	.1	.2	2.9	3.1	----------	1.4	.29	.06	.41	6	----------
.1	.1	T	.1	.3	3.6	3.9	----------	1.4	.36	.06	.42	8	----------
------	.1	T	T	.1	3.0	3.1	----------	1.9	.22	.07	.42	3	----------
T	.1	T	T	.1	4.3	4.4	----------	2.3	.26	.09	.42	2	----------
------	.1	T	T	.1	4.1	4.2	----------	2.4	.24	.05	.44	2	----------
T	.2	.1	T	.3	5.4	5.7	----------	3.5	.24	.08	.44	5	----------

TABLE 14.—*Approximate mineral composition of clay fraction in selected soils*

[Soils analyzed at the Soil Survey Laboratory, Soil Conservation Service, Beltsville, Md. Dash=not determined, n.d.=not detected, tr.=trace, x=small amount, xx=moderate amount, xxx=abundant amount, xxxx=dominant amount]

Soil	Horizon	Depth	X-ray analysis						Thermal analysis	
			Montmorillonite	Chlorite	Vermiculite	Mica	Interstratified layer	Quartz	Kaolinite	Gibbsite
		Inches								
Atmore silt loam:	A1	0–5	n.d.	n.d.	xxxx [1]	n.d.	n.d.	x	xxx	----
S68 Miss–24–1 (1 to 7); 68B243 to 68B-249.	A21g	5–9	----	----	----	----	----	----	----	----
	A22g&B	9–30	n.d.	n.d.	xxx [1]	n.d.	n.d.	x	xxx	----
	B21tg	30–39	n.d.	n.d.	xxx [1]	n.d.	n.d.	x	xxx	----
	B22tg	39–51	----	----	----	----	----	----	----	----
	B23tg	51–59	n.d.	n.d.	xx	n.d.	n.d.	tr.	xxxx	----
	B24tg	59–78	----	----	----	----	----	----		----
Escambia silt loam:	A1	0–4	----	----	----	----	----	----	----	----
S67 Miss–24–3 (1 to 8); 67B437 to 67B-444.	A2	4–16	n.d.	n.d.	xx	n.d.	xx [2]	x	23 percent	n.d.
	B21t	16–25	n.d.	n.d.	xx	n.d.	xx [2]	x	37 percent	n.d.
	B22t	25–35	----	----	----	----	----	----	----	----
	B23t	35–47	n.d.	n.d.	xxx	n.d.	tr. [2]	x	57 percent	n.d.
	B24t	47–59	----	----	----	----	----	----	----	----
	B25t	59–73	tr.	n.d.	xxx	n.d.	n.d.	x	46 percent	n.d.
	B3t	73–87	x	n.d.	x	n.d.	xx [3]	x	42 percent	n.d.
Poarch fine sandy loam:	Ap	0–6	----	----	----	----	----	----	----	----
S67 Miss–24–2 (1 to 9); 67B427 to 67B-435.	B21t	6–11	n.d.	n.d.	tr.	n.d.	xxx [2]	x	10 percent	2 percent.
	B22t	11–24	----	----	----	----	----	----	----	----
		24–35	n.d.	n.d.	n.d.	n.d.	xxx [2]	x	13 percent	5 percent.
	B23t	35–43	----	----	----	----	----	----	----	----
	B24t	43–52	----	----	----	----	----	----	----	----
	B25t	52–59	n.d.	n.d.	n.d.	n.d.	xxx [2]	tr.	32 percent	15 percent.
	B26t	59–73	----	----	----	----	----	----	----	----
	B27t	73–84	----	----	----	----	----	----	----	----

[1] Incomplete lattice collapse after K+ saturation and heating was probably caused by the obstructing interlayer of aluminum.
[2] Interstratified vermiculite chlorite.
[3] Interstratified vermiculite montmorillonite.

to 110°, 250°, and 500° C. are analyzed with a Geiger-counter diffractometer. Indicated minerals are estimated from recorder areas representing first-order, basal plane, X-ray reflection.

In the differential thermal analysis, air-dry, organic-matter free clay samples are analyzed in differential thermal apparatus. Percentages of kaolinite and gibbsite are estimated from the size of endotherm deflections at respective reaction temperatures.

Environmental Factors Affecting Use of the Soil

This section briefly describes the natural and cultural factors that affect the use and management of soils in Harrison County. Natural features include geology, topography, climate, water, and native vegetation. Some of the cultural features are transportation, manufacturing and commerce, and farming.

Geology

Materials of four geologic groups are exposed in Harrison County. From the oldest to the youngest, these are the Graham Ferry, Citronelle, and Pamlico Formations and Low terrace deposits (*3*).

The Graham Ferry Formation is exposed in the northwestern two-thirds of the county at intermediate and lower elevations. Stream banks and road cuts in the area expose a few feet of undifferentiated clays, clayey sands, and silty sands.

The Citronelle Formation is exposed on the highest uplands in the county. Large areas exist in the west-central, east-central, and extreme northeast parts of the county. The largest area enters Harrison County in the vicinity of the Forest Service Airey Tower (in Stone County) and extends southeastward to within 3 miles of Cedar Lake, where it disappears beneath younger deposits. This area is more than 3 miles wide at its broadest extent, approximately 15 miles long, and of irregular shape. Most of the soils here are well drained and reddish.

The Pamlico Formation underlies the Gulf Coast Flatwoods along the north shore of the Mississippi Sound. Much of the outer edge of the Pamlico Formation is capped by dunes and recent beach deposits. Biloxi, Gulfport, Long Beach, and Pass Christian are built upon this type material. Farther inland, the relief is low, the topography flat, and drainage is a problem. The Pamlico Formation is also exposed at Deer, Ship, and Cat Islands.

Low terrace deposits are dominantly tan, gray, and yellow sands. This formation is exposed in a broken belt several miles wide that extends across the county from east to west. Nugent is near the center of the area. Most areas of exposure are above the 50-foot contour. The soils on the broad low ridges are dominantly loamy and well drained.

Topography

Two distinct physiographic divisions are easily recognized in Harrison County. One is a distinctive low, essentially level strip of Coastal lowlands called the Gulf Coast Flatwoods. The other is the more or less rolling upland area of the interior. In most places the boundary between these two areas is sharply marked by an abrupt rise, but locally the change is gradual and rather poorly defined.

The Gulf Coast Flatwoods form an irregular belt along the entire southern boundary of Harrison County that is an average of about 5 miles wide. In the eastern part of the county this belt extends north of Back Bay of Biloxi for 1 or 2 miles. From there it extends westward through Landon to a point about 2 miles north of Jones Mill. The boundary continues about 1 mile north of Wolf River and St. Louis Bay into Hancock County. This strip of Coastal lowland consists of a series of wet, poorly drained depressions among somewhat higher and better drained areas. Several broad, shallow valleys in the area are cut by streams, and the bottoms of numerous drainageways are a few feet below the general level of the county. The waters in these drainageways flow through faintly developed channels or merely seep through the soil, except in time of heavy rains when there is flowing water.

The uplands of the Southern Lower Coastal Plain represent an older region of more weathered soils, where erosion has cut deeper valleys and surfaces are much more uneven. The region still preserves its virgin plainlike characteristics; and although the flat areas are numerous, they are small and seldom extend for more than a few square miles before breaking into rolling or gently undulating land. The surface features naturally vary with the locality. No large continuous hilly belts are in evidence, and such hills as do exist are mainly in the north-central and northwestern parts of the county. In a few places along the larger streams, there are marginal upland strips of comparatively rough country where the bluffs abruptly border the valleys. The main belts forming the interstream divides are rather broad and are undulating or gently rolling. The general slope of the county is toward the south.

The elevations of the county vary considerably. In the northern part they range from 90 feet above sea level at Lyman to more than 200 feet on ridges in the extreme northwest part. Near Wortham along Big Biloxi River the elevation is about 65 feet. From this point the flats rise at a more rapid rate. At the Louisville and Nashville Railroad Station at Gulfport the elevation is 25 feet. At Biloxi it is 24 feet. In the vicinity of Bayou Portage and at the mouths of Wolf and Tchoutacabouffa Rivers extensive low, level, marshy areas lie at about mean tide level. The elevation of the flatwoods ranges from sea level to less than 50 feet, and at Landon on the interior boundary, it is 28.5 feet.

The drainage of the Coastal flatwoods, owing to the character of the land and the faint slope, is generally restricted. The narrow belt immediately along the coast is of slightly more sandy porous material, is well drained, and has a comparatively low water table. Drainage ditches have been dug in several places in the western part of the Coastal country.

The larger streams of the county flow through nearly level flood plains, which range in width from about one-fourth mile to nearly a mile. Along the smaller branches and creeks they form strips from a few rods wide to about a quarter mile wide.

Many of the stream terraces of the higher inland division are only slightly higher than the stream bottoms and are subject to flooding at times of exceptionally high water.

Three principal river systems drain Harrison County. The western part lies within the drainage basin of Wolf River, which enters the county just above Sellers Bridge in the northwestern corner and flows in a southeasterly direction to within 5 miles from the coast, where it turns sharply to the southwest and empties into St. Louis Bay. Little Biloxi and Big Biloxi Creeks flow from the north-central part in a southeasterly direction and unite about 2½ miles above Wool Market to form Biloxi River. Tchoutacabouffa River meanders along the eastern edge of the county as far as its confluence with Tuxachanie Creek, its largest tributary. From this point it flows west and empties into Back Bay of Biloxi. Except along their lower courses, where they reach tide level, all these water systems have sufficient gradients to remove quickly any excess precipitation.

The channels of the larger creeks and rivers range from about 25 to 100 feet in width and from about 10 to 25 feet in depth along the greater part of their courses, but upon reaching base level near their mouths, they widen and deepen perceptibly.

Climate [9]

Harrison County is in the Coastal Division of Mississippi. This is a farm grouping of six counties that have more or less uniform climate. The climate, which is subtropical, is warm in summer but alternately warm and cold in winter. The temperature and precipitation data for Harrison County are given in tables 16, 17, and 18.

Temperatures of 90° F. or higher have occurred at Gulfport as early as May 4th (1951) and as late as October 16th (1947). The number of days with such temperatures has ranged from less than 45 to more than 95 (average 66). The number of days with such temperatures increases with the distance north of the Gulf. Occasionally, during the warmer season, westerly to northerly winds blow. If these winds persist, a period of drier hot weather occurs; if further prolonged, a drought affects farming in places and the danger of forest fires increases. There have been periods in which less than 0.1 inch of rain has been received in a month or more. Locations near the Gulf of Mexico have a more pronounced maritime climate than those farther inland. In general, summer maximums are hotter and winter minimums are cooler as the distance from the Gulf increases.

[9] Prepared by E. J. SALTSMAN, State climatologist, National Weather Service, U.S. Department of Commerce.

TABLE 15.—*Mineral composition*

[Dashes indicate determination not made. The

Soil	Horizon	Depth	Percent of 0.2–0.02 mm. fraction by petrographic analysis					
			Resistant minerals					
			Quartz	Aggregates	Iron minerals (magnetite and geothite, mostly)	Tourmaline	Zircon	Magnetite
		Inches						
Atmore silt loam: S68 Miss-24-1 (1 to 7); 68B243 to 68B249.	A1	0–5	96. 9	0. 8	1. 1	0. 3	t.	----------
	A21g	5–9	----------	----------	----------	----------	----------	----------
	A22g&B	9–30	97. 1	. 7	. 9	t.	0. 3	----------
	B21tg	30–39	97. 9	. 6	. 7	t.	. 2	----------
	B22tg	39–51	----------	----------	----------	----------	----------	----------
	B23tg	51–59	74. 6	. 9	24. 1	t.	n.d.	----------
	B24tg	59–78	----------	----------	----------	----------	----------	----------
Escambia silt loam: S67 Miss-24-3 (1 to 8); 67B437 to 67B444.	A1	0–4	----------	----------	----------	----------	----------	----------
	A2	4–16	----------	----------	----------	----------	----------	----------
	B21t	16–25	97. 1	----------	----------	0. 8	0. 6	1. 2
	B22t	25–35	----------	----------	----------	----------	----------	----------
	B23t	35–47	96. 5	----------	----------	. 5	. 7	1. 4
	B24t	47–59	----------	----------	----------	----------	----------	----------
	B25t	59–73	97. 2	----------	----------	. 7	. 6	1. 1
	B3t	73–87	----------	----------	----------	----------	----------	----------
Poarch fine sandy loam: S67 Miss-24-2 (1 to 9); 67B427–67B435.	Ap	0–6	----------	----------	----------	----------	----------	----------
	B21t	6–11	----------	----------	----------	----------	----------	----------
	B22t	11–24	----------	----------	----------	----------	----------	----------
		24–35	95. 4	----------	----------	. 9	. 7	2. 6
	B23t	35–43	----------	----------	----------	----------	----------	----------
	B24t	43–52	----------	----------	----------	----------	----------	----------
	B25t	52–59	98. 0	----------	----------	. 4	. 6	1. 0
	B26t	59–73	----------	----------	----------	----------	----------	----------
	B27t	73–84	----------	----------	----------	----------	----------	----------

of a portion of sand and silt

letter t. means trace; n.d. means not detected]

Percent of 0.2–0.02 mm. fraction by petrographic analysis—Continued													
Resistant minerals—Con.			Weatherable minerals										Total weatherable minerals
Rutile	Kyanite	Total resistant minerals	Feldspars	Plant opal	Enstatite	Carbonates	Hornblende	Glass	Kyanite	Vermiculite	Sphene	
		99. 1	0. 2	0. 6		0. 2	t.			t.	n.d.	1. 0
		99. 0	. 3	. 4		n.d.	0. 2			n.d.	t.	. 9
		99. 4	. 2	. 3		n.d.	t.			n.d.	t.	. 5
		99. 6	. 4	n.d.		n.d.	n.d.			n.d.	n.d.	. 4
n.d.		99. 7	n.d.		0. 4			t.				. 4
0. 5		99. 6	0. 4		n.d.			t.				. 4
n.d.		99. 6	n.d.		0. 4			t.				. 4
	0. 4	100. 0										
	n.d.	100. 0										

TABLE 16.—*Temperature and precipitation data*

[All data from the Gulfport Station, Harrison County, Miss.]

Month	Temperature				Precipitation				Average number of days with—	
	Average daily maximum	Average daily minimum	Average		Average total	1 year in 10 will have—		Number of days with 0.10 inch or more	Maximum temperature of 90° F. and above	Minimum temperature of 32° F. and below
			Maximum	Minimum		Less than—	More than—			
	°F.	°F.	°F.	°F.	Inches	Inches	Inches			
January	62	43	74	23	4.9	1.7	8.3	7	0	6
February	65	45	76	28	4.8	1.9	8.4	7	0	4
March	69	50	80	33	5.1	1.2	10.1	6	0	1
April	77	59	85	43	5.4	1.1	11.2	5	0	0
May	84	66	87	53	3.9	1.3	7.2	5	3	0
June	89	71	91	63	5.1	1.2	10.3	7	14	0
July	91	73	96	67	7.4	4.1	11.9	10	20	0
August	91	73	97	66	5.5	1.7	10.3	8	21	0
September	87	69	94	57	8.0	2.1	15.6	7	9	0
October	80	58	88	43	3.0	.2	6.5	4	(1)	0
November	70	49	81	31	3.6	.7	7.4	4	0	1
December	63	44	75	26	5.6	2.5	9.3	7	0	5
Year	77	58	(2) 98	(3) 20	62.3	45.7	80.4	77	66	17

1 Less than one half.
2 Average annual highest temperature.
3 Average annual lowest temperature.

TABLE 17.—*Probabilities of freezing temperatures in spring and fall*

[All data from the Harrison Experimental Forest Station]

Probability	Dates for given probability and temperature				
	24° F.	28° F.	32° F.	36° F.	40° F.
Spring:					
1 year in 10 later than	February 26	March 24	March 28	April 1	April 24
2 years in 10 later than	February 18	March 14	March 22	March 28	April 17
5 years in 10 later than	February 1	February 25	March 11	March 22	April 3
Fall:					
1 year in 10 earlier than	December 17	November 30	November 18	November 5	October 28
2 years in 10 earlier than	December 2	November 18	November 8	October 28	October 20
5 years in 10 earlier than	November 25	November 11	November 2	October 23	October 16

Rainfall is the shower type; prolonged rains are not frequent and generally occur in winter. In the period of a year, lightning or thunder occurs on about two-thirds of the days that have precipitation; at times, a month in the cooler part of the year may have no days with thunderstorms or only one. Summer generally is the wettest season. Annual rainfall totals increase slightly with distance north from the coast. The difference is chiefly due to the more frequent and heavier warm-season showers in the interior, which result from higher temperatures and upslope lifting of moist air. Excessive rainfall, more than one quarter of an inch in 5 minutes, may occur in any season. Occasionally, torrential rains occur. Generally, the more intense of these are associated with thunderstorms, particularly those of shorter duration. However, tropical storms generally cause heavier rains over longer periods of time.

During the colder part of the year, the most common weather cycle is rain followed by a few days of relatively warm, balmy weather and then by another rain. Years may go by with no snowfall or amounts too small to measure. Cold spells are generally short. Temperatures of 32° F. or lower have recently occurred at Gulfport as early in fall as November 3rd (1966, 27°) and as late in spring as March 27th (1955, 27°). The number of days in a year with temperatures of 32° or lower at Gulfport ranges from more than 30 to less than 10 (average 17). A temperature of 1° above zero was reported at Biloxi on Feb-

TABLE 18.—*Rainfall frequency in Harrison County, Miss.*

Duration	Return period for a central location [1]			
	2 years	10 years	50 years	100 years
	Inches	*Inches*	*Inches*	*Inches*
10 minutes	1. 1	1. 5	1. 8	2. 0
1 hour	2. 4	3. 3	4. 0	4. 4
3 hours	3. 3	4. 7	5. 9	6. 7
12 hours	4. 9	7. 4	9. 4	10. 4
1 day	6. 0	8. 8	11. 4	12. 6
2 days	6. 6	9. 9	13. 1	14. 2
3 days	9. 0	12. 2	16. 2	17. 7

[1] Locations nearer the Mississippi Sound can expect larger amounts; locations farther inland can expect lesser amounts.

ruary 12, 1899; this occurred during one of the few cold spells when daytime temperatures did not rise to well above freezing.

On the day of the winter solstice (December 22) the sun is above the horizon in Harrison County for 10 hours and about 11 minutes. After that date the length of the day increases until the summer solstice (June 21), when the sun is above the horizon 14 hours and about 8 minutes. In a typical year the county receives slightly less than two-thirds of the possible sunshine.

Winds are generally southeasterly or southwesterly. The speed of the wind is generally under 10 miles an hour except during storms. Windspeeds of 45 miles an hour or more are estimated to recur at intervals of about 2 years. At 50-year intervals the wind reaches an extreme sustained speed of about 90 miles an hour at an elevation of 30 feet, and gusts have higher speeds. Water areas have a marked effect on extreme windspeeds. In unobstructed areas near large bodies of water, extreme windspeeds may be as much as 30 miles an hour greater than those a short distance inland.

There is daytime unequal heating and nighttime unequal cooling of the water masses of the Mississippi Sound and of the adjacent land masses. Ordinarily, an onshore air current called the "sea breeze" starts late in morning and reaches maximum velocity in early or midafternoon. After sunset, a reverse offshore nocturnal circulation, the "land breeze," develops. The sea breeze may last from 5 to 12 hours; the land breeze is generally pronounced for only a few hours.

Temperatures are measured in a standard Weather Bureau instrument shelter that has the thermometer 4½ feet above the ground. On clear, calm nights, the temperature at shelter level usually is several degrees warmer than the air near the ground. Under these conditions, frost could form on vegetation at ground level, even though temperature in the shelter is above 32°.

The growing season is the freeze-free period between the last 32° temperature in spring and the first 32° temperature in fall. The effect of temperature varies according to the kind, type, and variety of vegetation. The period of record for the data in table 16 is May 1954 to December 1970, and data have been adjusted, where necessary, for seasons not having a temperature as low as the indicated threshold. These data are applicable to most of the inland part of the county. The section of the county near the Mississippi Sound would likely have a slightly longer freeze-free period that has slightly earlier spring dates and slightly later fall dates for the given probability and temperature.

Water

Potable and industrial water supplies in Harrison County are plentiful. Nearly all of the needs of the county are being met by deep wells. Artesian wells receive water from several aquifers in the southern third of the county, and in other areas, from low-lying river bottoms.

Numerous sites exist for lakes on larger streams and rivers. Shortage of potable and industrial water is not anticipated in the foreseeable future.

Native Trees

The native commercial trees of the well-drained uplands were mainly longleaf and slash pine. Trees on the broad wet flats were mainly loblolly and slash pine, sweetgum, and sweetbay. The better drained bottom lands supported loblolly, slash, and spruce pines and oak, magnolia, holly, and beech. Nearly level soils supported, in addition to the above, oak, bay, hickory, blackgum, and swamp blackgum. Among native species in old sloughs and depressions are tupelo gum, cypress, bay, and magnolia.

Cultural Development

Harrison County is served by two railroads. Freight service is available south and north and every few hours to the east and to the west.

Motor freight service is excellent. Freight lines from Mobile to New Orleans use U.S. Highway 90, which follows the coastline across the county. Also, daily service is offered north from Gulfport on Highway 49 to Hattiesburg, Jackson, and ponts beyond. Many trucking companies operate in the county and provide all types of trucking, moving, and storage facilities. Harrison County is one of the few counties in the State that has four-lane highways, running east and west and also north and south.

Gulfport has one of the most modern airports in Mississippi. It is used for daily commercial jet flights and as a National Guard training center.

Harrison County is served by two major bus lines. Buses travel to Hattiesburg, Jackson, and other cities and towns along the coast.

Gulfport is the only State-owned port that is used by numerous ocean-going freighters. Several water transportation companies headquartered at Gulfport operate on the Gulf and to points upriver. Steamships with drafts in excess of 30 feet can use the port. The port and the Harrison County Industrial Waterway are connected to the Intercoastal Canal.

Harrison County has numerous industries and manufacturing plants, mostly farm related. Two dairy processing plants in the county purchase Grade A raw milk. One large treating plant manufactures telephone poles, piling, and treated lumber. There are several large modern sawmills and planer mills and a commercial egg-processing plant. Eight commercial wholesale nurseries and greenhouses ship ornamental shrubs and flowers throughout the eastern United States.

Two small packinghouses buy livestock locally, and

other livestock is sold at markets in nearby counties. Two large commercial recreational fishing lakes provide good freshwater fishing. Also, a pecan shelling and processing plant is in Gulfport.

Because of the rapid expansion of industry, proximity to beautiful beaches and the warm waters of the Gulf of Mexico, large government installations and numerous other favorable features, Harrison County is rapidly becoming more urban. Large areas of former farmlands are being converted into residential subdivisions, shopping centers, streets, highways, and industrial areas. Although the southern part of the county is being developed more rapidly, all sections of the county are experiencing growth in population.

The proportion of the land area in farms is decreasing, and the decrease will probably continue. Cash receipts from many phases of farming, however, are increasing. Greenhouse and nursery products have shown a significant consistent gain in cash receipts over the last 30 years.

Farms are fewer in number and larger in size. In 1939, there were 1,030 farms in the county, and in 1969 there were 320. Cropland harvested and cropland used for pasture are decreasing. In 1939, there were 12,000 acres of cropland harvested; and in 1969, only 5,813. Woodland used for pasture is decreasing. Hay tonnage, soybeans for beans, and oats for grain are the only categories showing increases since 1939. According to the U.S. Census of Agriculture, the acreage of corn harvested for grain dropped from 3,162 in 1939 to 616 in 1969; and harvested hay increased from 942 acres in 1939 to 1,666 acres in 1969.

Present trends in population and industrial growth and associated soil use are expected to continue into the 1990's.

Literature Cited

(1) American Association of State Highway Officials.
1961. Standard specifications for highway materials and methods of sampling and testing. Ed. 8, 2 v, illus.

(2) Brasher, B. R., Franzmeier, D. P., Vallassis, V., and Davidson, S. E.
1966. Use of saran resin to coat natural soil clods for bulk density and water retention measurements. Soil Sci. 101: 108.

(3) Brown, Glen Francis, Foster, V. M., Adams, R. W., Reed, E. W., and Padgett, H. D., Jr.
1944. Geology and ground-water resources of the coastal area in Mississippi. Mississippi State Geol. Surv. Bul. 60, pp. 45–61, illus.

(4) Hedlund, A. and Earles, J. M.
1969. Forest statistics for Mississippi counties. U.S. Dept. Agr., For. Serv. Southern Forest Expt. Sta. Res. Bul. SO–15, 24 pp.

(5) Kilmer, Victor J. and Alexander, Lyle T.
1949. Methods of making mechanical analysis of soils. Soil Sci. 68: 15–24.

(6) Lemmon, Paul E.
1970. Grouping soils on the basis of woodland suitability. Proc. of Third No. Amer. Forest Soils Conf. North Carolina State Univ., pp. 413–426.

(7) ———
1958. Soil interpretations for woodland conservation. Proc. of the First No. Amer. Forest Soils Conf., Mich. Agr. Expt. Sta., pp. 153–158.

(8) Peech, Michael, Alexander, Lyle T., et al.
1947. Methods of soil analysis for soil-fertility investigations. U.S. Dept. Agr. Cir. 757, 25 pp.

(9) Richards, L. A. ed.
1954. U.S. Dept. Agr. Handbook 60, p. 109.

(10) United States Department of Agriculture.
1938. Soils and men. U.S. Dept. Agr. Ybk. 978–1001, illus.

(11) ———
1951. Soil survey manual. Agr. Handbook No. 18, 503 pp., illus. [Supplement issued in May 1962]

(12) ———
1960. Soil classification, a comprehensive system, 7th approximation. U.S. Dept. Agr., Soil Conserv. Serv. 265 pp., illus.

(13) United States Department of Defense.
1968. Unified soil classification system for roads, airfields, embankments and foundations. MIL–STD–619B, 30 pp., illus.

(14) Yuan, T. L.
1959. Determination of exchangeable hydrogen in soils by titration method. Soil Sci. 88: 164–167.

Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as a percentage of the cation-exchange capacity.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to described consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Erosion. The wearing away of the land surface by wind (sandblast), running water, and other geological agents.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Fragipan. A loamy, brittle subsurface horizon that is very low in organic-matter content and clay but is rich in silt or very fine sand. The layer is seemingly cemented. When dry, it is hard or very hard and has a high bulk density in comparison with the horizon or horizons above it. When moist, the fragipan tends to rupture suddenly if pressure is applied, rather than to deform slowly. The layer is generally mottled, is slowly or very slowly permeable to water, and has few or many bleached fracture planes that form polygons. Fragipans are a few inches to several feet thick; they generally occur below the B horizon, 15 to 40 inches below the surface.

Genesis, soil. The manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that

are responsible for the development of the solum, or true soil, from the unconsolidated parent material, as conditioned by relief and age of landform.

Gleyed soil. A soil in which waterlogging and lack of oxygen have caused the material in one or more horizons to be neutral gray in color. The term "gleyed" is applied to soil horizons with yellow and gray mottling caused by intermittent waterlogging.

Horizon, soil. A layer of soil, approximately parallel to the surface that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon.—The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.—The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon.—The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is a solum.

C horizon.—The weathered rock material immediately beneath the solum. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer.—Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Internal soil drainage. The downward movement of water through the soil profile. The rate of movement is determined by the texture, structure, and other characteristics of the soil profile and underlying layers, and by height of the water table, either permanent or perched. Relative terms for expressing internal drainage are *none, very slow, slow, medium, rapid,* and *very rapid.*

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and their thickness and arrangement in the soil profile.

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance—*few, common,* and *many;* size—*fine, medium,* and *coarse;* and contrast—*faint, distinct,* and *prominent.* The size measurements are these: *fine,* less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; *medium,* ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and *coarse,* more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Natural soil drainage. Refers to the conditions of frequency and duration of periods of saturation or partial saturation that existed during the development of the soil, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well-drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in or immediately beneath the solum. They have uniform color in the A horizon and upper part of the B horizons and have mottling in the lower part of the B horizon and the C horizon.

Somewhat poorly drained soils are wet for significant periods but not all the time, and some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods and are light gray and generally mottled from the surface downward, although mottling may be lacking or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: *very slow, slow, moderately slow, moderate, moderately rapid, rapid,* and *very rapid.*

pH value. A numerical means for designating acidity and alkalinity in soils. A pH value of 7.0 indicates precise neutrality; a higher value, alkalinity; and a lower value, acidity.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents that commonly shows as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to hardpan or to irregular aggregates upon repeated wetting and drying, or it is the hardened relicts of the soft, red mottles. It is a form of laterite.

Plowpan. A compacted layer formed in the soil immediately below the plowed layer.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

	pH		*pH*
Extremely acid	Below 4.5	Neutral	6.6 to 7.3
Very strongly acid	4.5 to 5.0	Mildly alkaline	7.4 to 7.8
Strongly acid	5.1 to 5.5	Moderately alkaline	7.9 to 8.4
Medium acid	5.6 to 6.0	Strongly alkaline	8.5 to 9.0
Slightly acid	6.1 to 6.5	Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residual material. Unconsolidated, partly weathered mineral material that accumulates over disintegrating solid rock. Residual material is not soil but is frequently the material in which a soil has formed.

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Sesquioxides. Oxides having trivalent cations, as iron or aluminum oxides.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of an equal mass of unaggregated primary soil particles. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grain* (each grain by itself, as in dune sand) or *massive* (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay.* The sand, loamy sand and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Tilth, soil. The condition of the soil in relation to the growth of plants, especially soil structure. Good tilth refers to the friable state and is associated with high noncapillary porosity and stable, granular structure. A soil in poor tilth is nonfriable, hard, nonaggregated, and difficult to till.

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

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GUIDE TO MAPPING UNITS

For a full description of a mapping unit, read both the description of the mapping unit and that of the soil series to which the mapping unit belongs. Other information is given in tables as follows:

Acreage and extent, table 1, page 10.
Estimated yields, table 2, page 32.
Wildlife, table 4, page 38.
Woodland, table 5, page 40.
Engineering, tables 6, 7, and 8, pages 46 to 55.

Map symbol	Mapping unit	Page	Capability unit	Woodland group
At	Atmore silt loam	10	IVw-1	2w9
Cb	Coastal beach	10	VIIIs-1	---
Es	Escambia silt loam	12	IIw-2	2w8
EtB	Eustis loamy sand, 0 to 5 percent slopes	12	IIIs-1	3s2
EuE	Eustis and Poarch soils, 8 to 17 percent slopes	12	-------	---
	Eustis soil	--	VIIs-1	3s2
	Poarch soil	--	IVe-1	2o1
Ha	Handsboro association1/	13	VIIIw-1	---
HlA	Harleston fine sandy loam, 0 to 2 percent slopes	14	IIw-1	2w8
HlB	Harleston fine sandy loam, 2 to 5 percent slopes	15	IIe-1	2w8
Hy	Hyde silt loam	15	IVw-1	1w9
Lr	Lakeland fine sand	16	IVs-1	4s3
Lt	Latonia loamy sand	17	IIe-2	2o1
MlB	McLaurin fine sandy loam, 2 to 5 percent slopes	17	IIe-2	2o1
MlC	McLaurin fine sandy loam, 5 to 8 percent slopes	17	IIIe-1	2o1
Nh	Nahunta silt loam	18	IIw-2	2w8
Nu	Nugent and Jena soils1/	19	Vw-1	---
	Nugent soil	--	-------	2s8
	Jena soil	--	-------	1o7
Oc	Ocilla loamy sand	20	IIIw-1	3o2
Pm	Plummer loamy sand	21	IVw-2	2w3
PoA	Poarch fine sandy loam, 0 to 2 percent slopes	22	I-1	2o1
PoB	Poarch fine sandy loam, 2 to 5 percent slopes	22	IIe-2	2o1
PoC	Poarch fine sandy loam, 5 to 12 percent slopes	23	IVe-1	2o1
Ps	Ponzer and Smithton soils1/	24	-------	---
	Ponzer soil	--	VIIw-1	4w3
	Smithton soil	--	Vw-2	2w9
RuA	Ruston fine sandy loam, 0 to 2 percent slopes	25	I-1	2o1
RuB	Ruston fine sandy loam, 2 to 5 percent slopes	25	IIe-2	2o1
RuC	Ruston fine sandy loam, 5 to 8 percent slopes	25	IIIe-1	2o1
RuD	Ruston fine sandy loam, 8 to 12 percent slopes	26	IVe-1	2o1
SfB	Saucier fine sandy loam, 2 to 5 percent slopes	27	IIe-1	3w2
SfC	Saucier fine sandy loam, 5 to 8 percent slopes	27	IIIe-1	3w2
ShC	Saucier, Smithton, and Susquehanna soils, rolling1/	27	-------	---
	Saucier soil	--	IVe-1	3w2
	Smithton soil	--	IIIw-2	2w9
	Susquehanna soil	--	VIe-1	3c2
SnB	Saucier-Susquehanna complex, 2 to 5 percent slopes	28	IVe-2	3c2
SsE	Smithdale fine sandy loam, 12 to 17 percent slopes	29	VIe-2	2o1
St	Smithton fine sandy loam	29	IIIw-2	2w9
Su	St. Lucie sand	30	VIIs-2	5s3
Sv	St. Lucie sand, hummocky	30	VIIIs-1	---
Sw	Sulfaquepts	30	VIIIs-2	---

1/ Mapped areas are much larger and the composition of the soils more variable than other mapping units in the county. Mapping has been controlled well enough, however, for the anticipated use of the soils.

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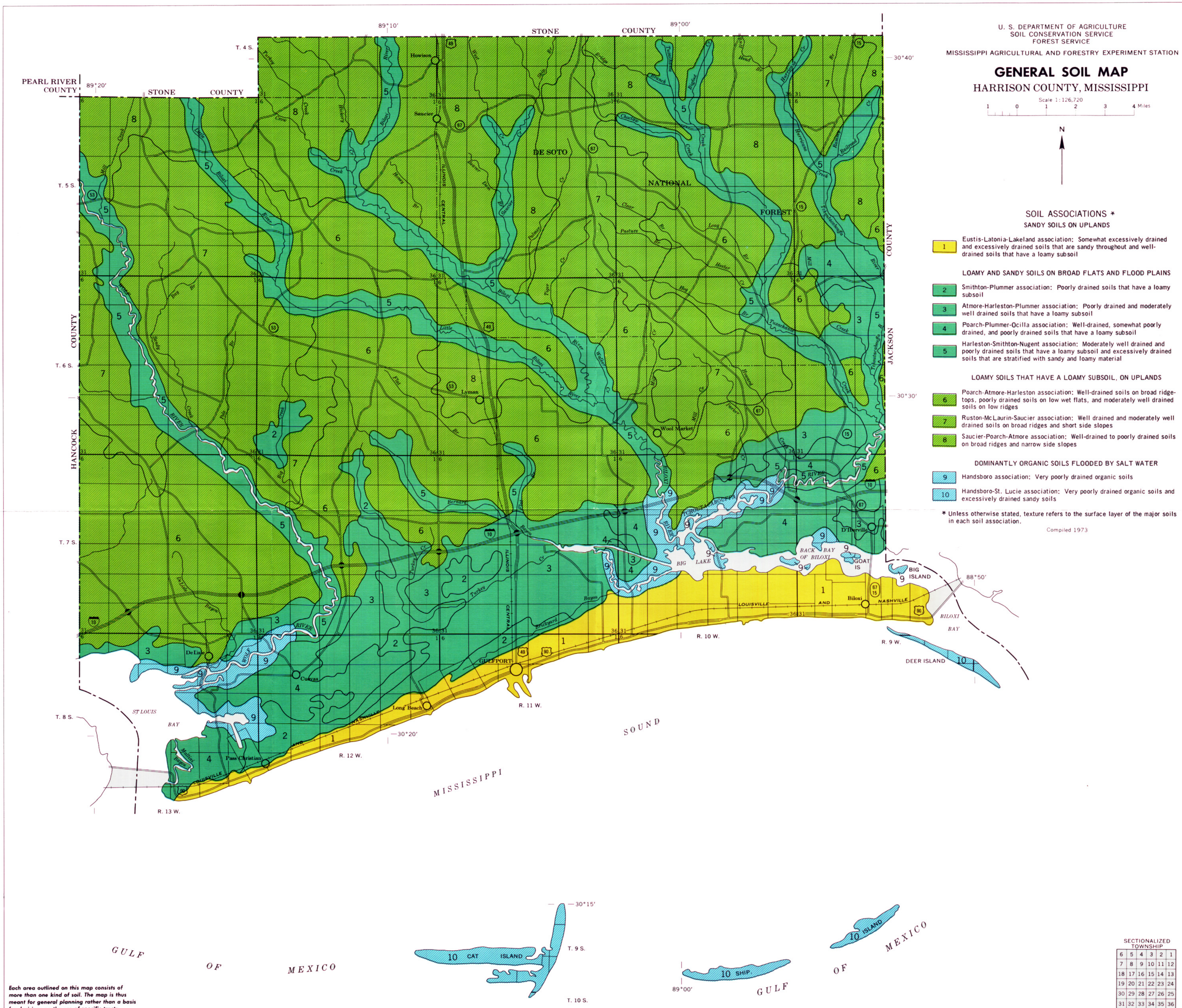
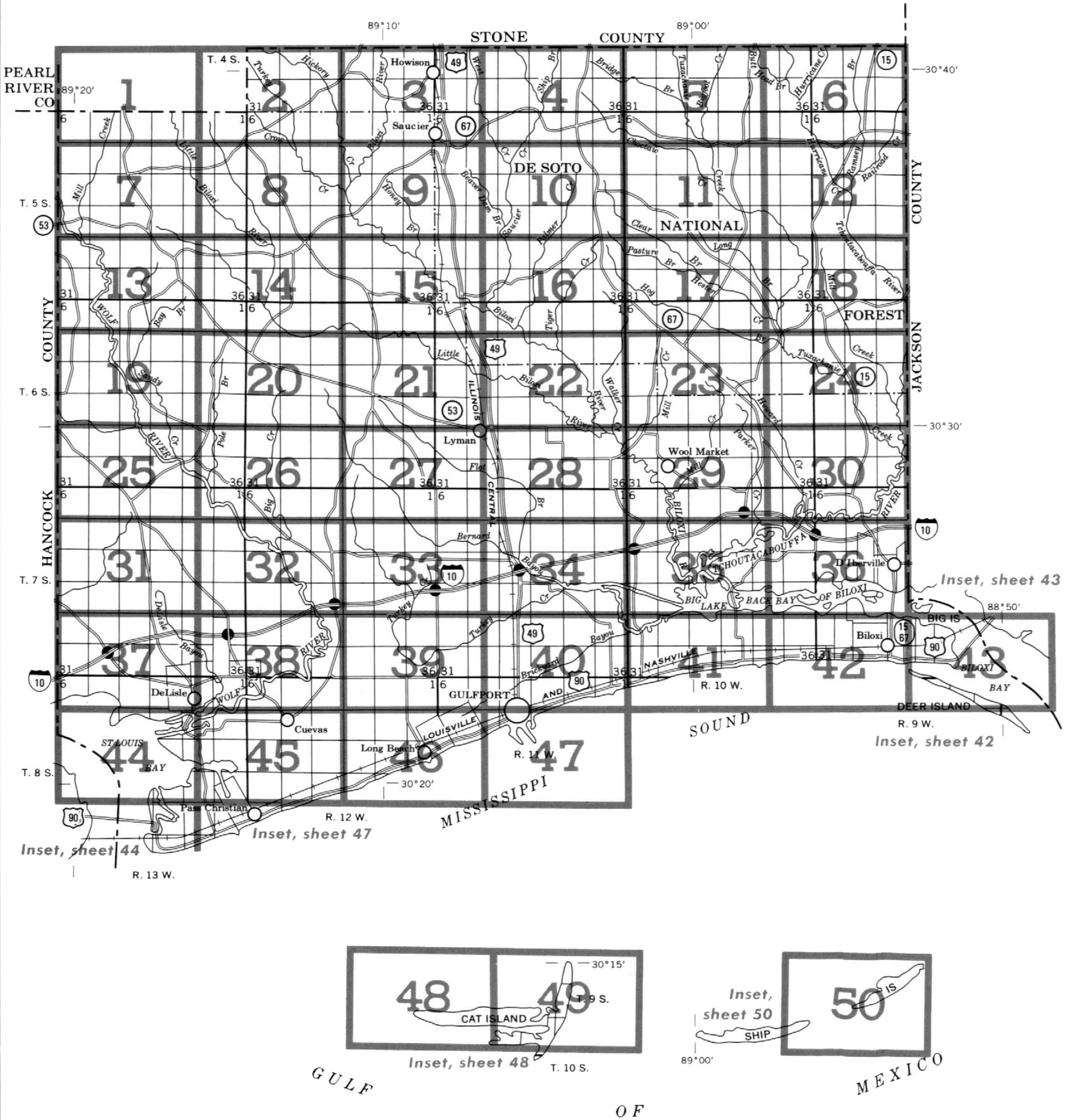


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FOREST SERVICE
MISSISSIPPI AGRICULTURAL AND FORESTRY EXPERIMENT STATION
GENERAL SOIL MAP
HARRISON COUNTY, MISSISSIPPI
Scale 1:126,720
1 0 1 2 3 4 Miles
N
SOIL ASSOCIATIONS *
SANDY SOILS ON UPLANDS
1 Eustis-Latonia-Lakeland association: Somewhat excessively drained and excessively drained soils that are sandy throughout and well-drained soils that have a loamy subsoil
LOAMY AND SANDY SOILS ON BROAD FLATS AND FLOOD PLAINS
2 Smithton-Plummer association: Poorly drained soils that have a loamy subsoil
3 Atmore-Harleston-Plummer association: Poorly drained and moderately well drained soils that have a loamy subsoil
4 Poarch-Plummer-Ocilla association: Well-drained, somewhat poorly drained, and poorly drained soils that have a loamy subsoil
5 Harleston-Smithton-Nugent association: Moderately well drained and poorly drained soils that have a loamy subsoil and excessively drained soils that are stratified with sandy and loamy material
LOAMY SOILS THAT HAVE A LOAMY SUBSOIL, ON UPLANDS
6 Poarch-Atmore-Harleston association; Well-drained soils on broad ridgetops, poorly drained soils on low wet flats, and moderately well drained soils on low ridges
7 Ruston-McLaurin-Saucier association: Well drained and moderately well drained soils on broad ridges and short side slopes
8 Saucier-Poarch-Atmore association; Well-drained to poorly drained soils on broad ridges and narrow side slopes
DOMINANTLY ORGANIC SOILS FLOODED BY SALT WATER
9 Handsboro association: Very poorly drained organic soils
10 Handsboro-St. Lucie association: Very poorly drained organic soils and excessively drained sandy soils
* Unless otherwise stated, texture refers to the surface layer of the major soils in each soil association.
Compiled 1973
PEARL RIVER COUNTY
STONE COUNTY
HANCOCK COUNTY
JACKSON COUNTY
DE SOTO NATIONAL FOREST
Howison
Saucier
Lyman
Wool Market
D'Iberville
Biloxi
Gulfport
Long Beach
Pass Christian
DeLisle
Cuevas
BIG LAKE
BACK BAY OF BILOXI
GOAT IS
BIG ISLAND
BILOXI BAY
DEER ISLAND
ST LOUIS BAY
MISSISSIPPI SOUND
CAT ISLAND
SHIP ISLAND
GULF OF MEXICO
89°20'
89°10'
89°00'
88°50'
30°40'
30°30'
30°20'
30°15'
T. 4 S.
T. 5 S.
T. 6 S.
T. 7 S.
T. 8 S.
T. 9 S.
T. 10 S.
R. 13 W.
R. 12 W.
R. 11 W.
R. 10 W.
R. 9 W.
SECTIONALIZED TOWNSHIP
6 5 4 3 2 1
7 8 9 10 11 12
18 17 16 15 14 13
19 20 21 22 23 24
30 29 28 27 26 25
31 32 33 34 35 36
Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



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INDEX TO MAP SHEETS
HARRISON COUNTY, MISSISSIPPI

Scale 1:253,440

1 0 1 2 3 4 Miles

SECTIONALIZED TOWNSHIP

6	5	4	3	2	1
7	8	9	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

SOIL LEGEND

The first capital letter is the initial one of the soil name. A second capital letter, A, B, C, D, or E, shows the slope. Most symbols without a slope letter are those of nearly level soils, but some are for land types that have a considerable range of slope.

SYMBOL	NAME
At	Atmore silt loam
Cb	Coastal beach
Es	Escambia silt loam
EtB	Eustis loamy sand, 0 to 5 percent slopes
EuE	Eustis and Poarch soils, 8 to 17 percent slopes
Ha	Handsboro association *
HlA	Harleston fine sandy loam, 0 to 2 percent slopes
HlB	Harleston fine sandy loam, 2 to 5 percent slopes
Hy	Hyde silt loam
Lr	Lakeland fine sand
Lt	Latonia loamy sand
MlB	McLaurin fine sandy loam, 2 to 5 percent slopes
MlC	McLaurin fine sandy loam, 5 to 8 percent slopes
Nh	Nahunta silt loam
Nu	Nugent and Jena soils *
Oc	Ocilla loamy sand
Pm	Plummer loamy sand
PoA	Poarch fine sandy loam, 0 to 2 percent slopes
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RuC	Ruston fine sandy loam, 5 to 8 percent slopes
RuD	Ruston fine sandy loam, 8 to 12 percent slopes
SfB	Saucier fine sandy loam, 2 to 5 percent slopes
SfC	Saucier fine sandy loam, 5 to 8 percent slopes
ShC	Saucier, Smithton, and Susquehanna soils, rolling *
SnB	Saucier-Susquehanna complex, 2 to 5 percent slopes
SsE	Smithdale fine sandy loam, 12 to 17 percent slopes
St	Smithton fine sandy loam
Su	St. Lucie sand
Sv	St. Lucie sand, hummocky
Sw	Sulfaquepts *

* The delineations generally are much larger and the composition of these units is more variable than other map units in the county. Mapping has been controlled well enough, however, for the anticipated use of the soils.

CONVENTIONAL SIGNS

WORKS AND STRUCTURES

Highways and roads
- Divided
- Good motor
- Poor motor
- Trail

Highway markers
- National Interstate
- U. S.
- State or county

Railroads
- Single track
- Multiple track
- Abandoned

Bridges and crossings
- Road
- Trail
- Railroad
- Ferry (FY)
- Ford (FORD)
- Grade
- R. R. over
- R. R. under

Buildings
- School
- Church

Prospect mine

Gravel pit (G.P.)

Power line

Pipeline

Cemetery

Dams

Levee

Sawmill

Fort

Forest fire or lookout station

Lighthouse

Located object

BOUNDARIES

- National or state
- County
- Minor civil division
- Reservation
- Land grant
- Small park, cemetery, airport
- Land survey division corners

DRAINAGE

Streams, double-line
- Perennial
- Intermittent

Streams, single-line
- Perennial
- Intermittent
  - Crossable with tillage implements
  - Not crossable with tillage implements
  - Unclassified

Canals and ditches

Lakes and ponds
- Perennial (water, w)
- Intermittent (int)

Spring

Marsh or swamp

Wet spot

Drainage end or alluvial fan

RELIEF

Escarpments
- Bedrock
- Other

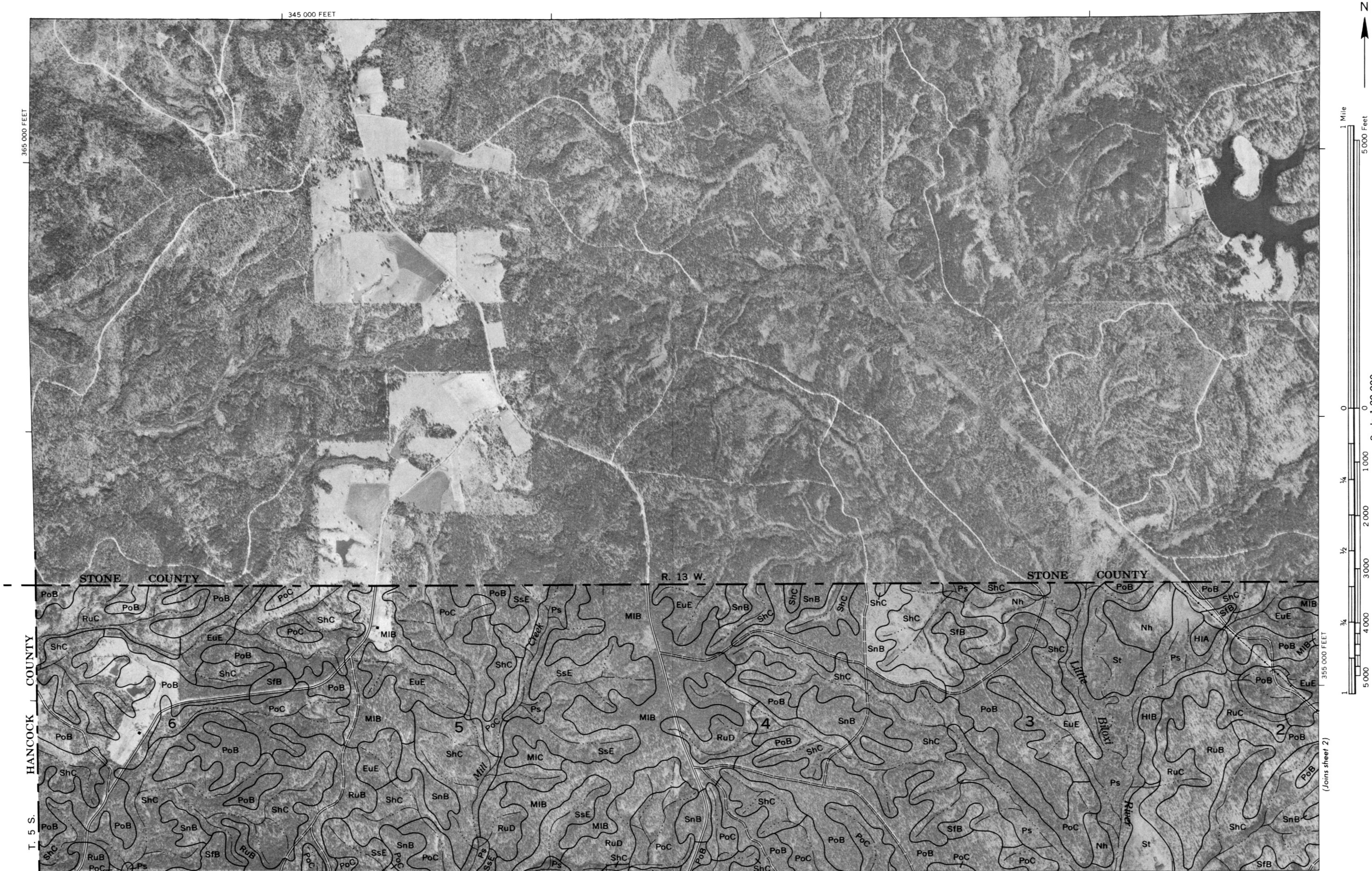
Short steep slope

Prominent peak

Depressions (Large, Small)
- Crossable with tillage implements
- Not crossable with tillage implements
- Contains water most of the time

SOIL SURVEY DATA

- Soil boundary and symbol (Dx)
- Gravel
- Stoniness: Stony; Very stony
- Rock outcrops
- Chert fragments
- Clay spot
- Sand spot
- Gumbo or scabby spot
- Made land
- Severely eroded spot
- Blowout, wind erosion
- Gully
- Sand pit (S.P.)
- Borrow pit (B.P.)



HARRISON COUNTY, MISSISSIPPI NO. 1

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone. Land division corners are approximately positioned on this map.

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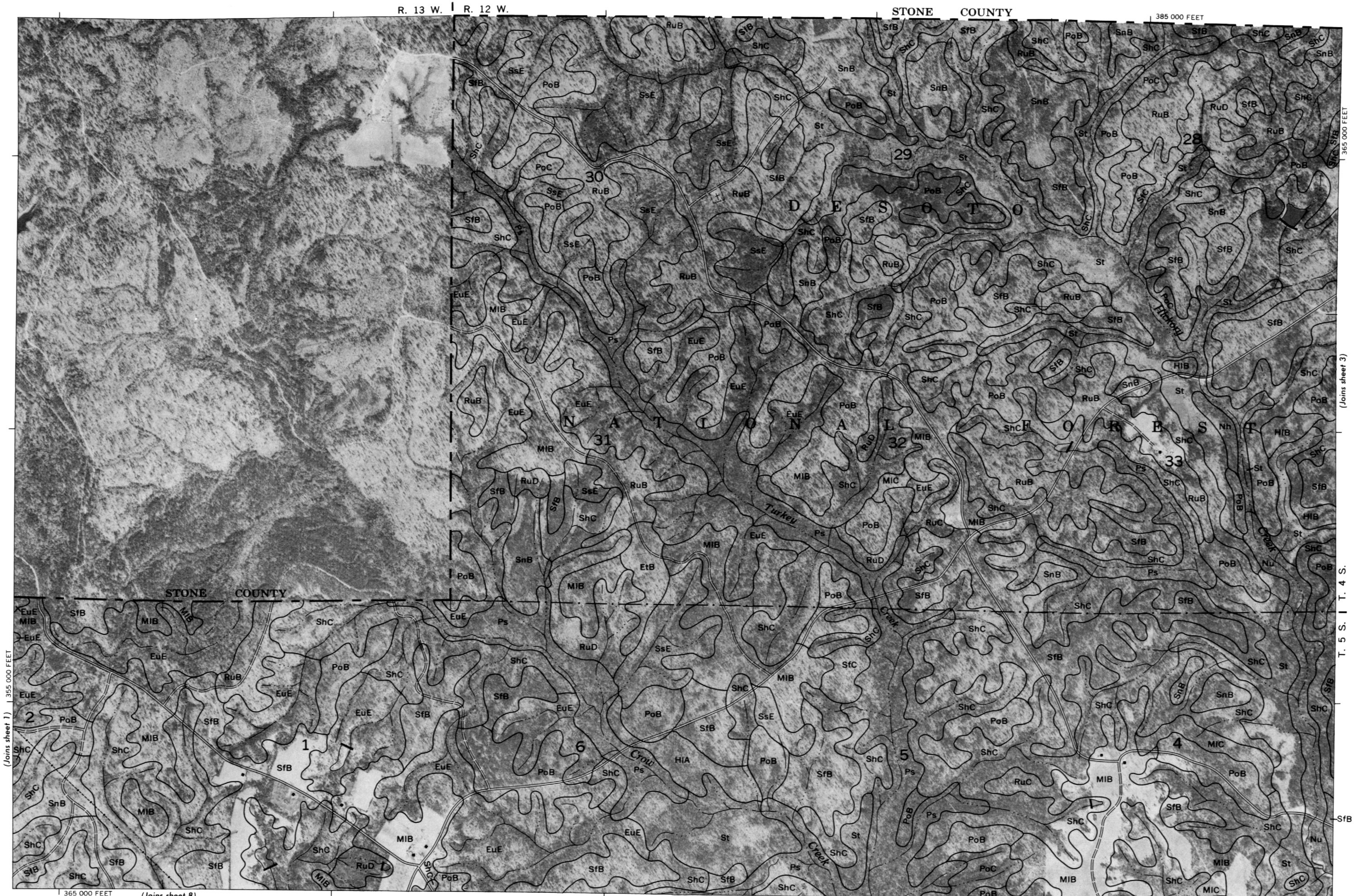
HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 2



Scale 1:20 000

1 Mile
5000 Feet
0
1000
2000
3000
4000
5000
0
¼
½
¾
1

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

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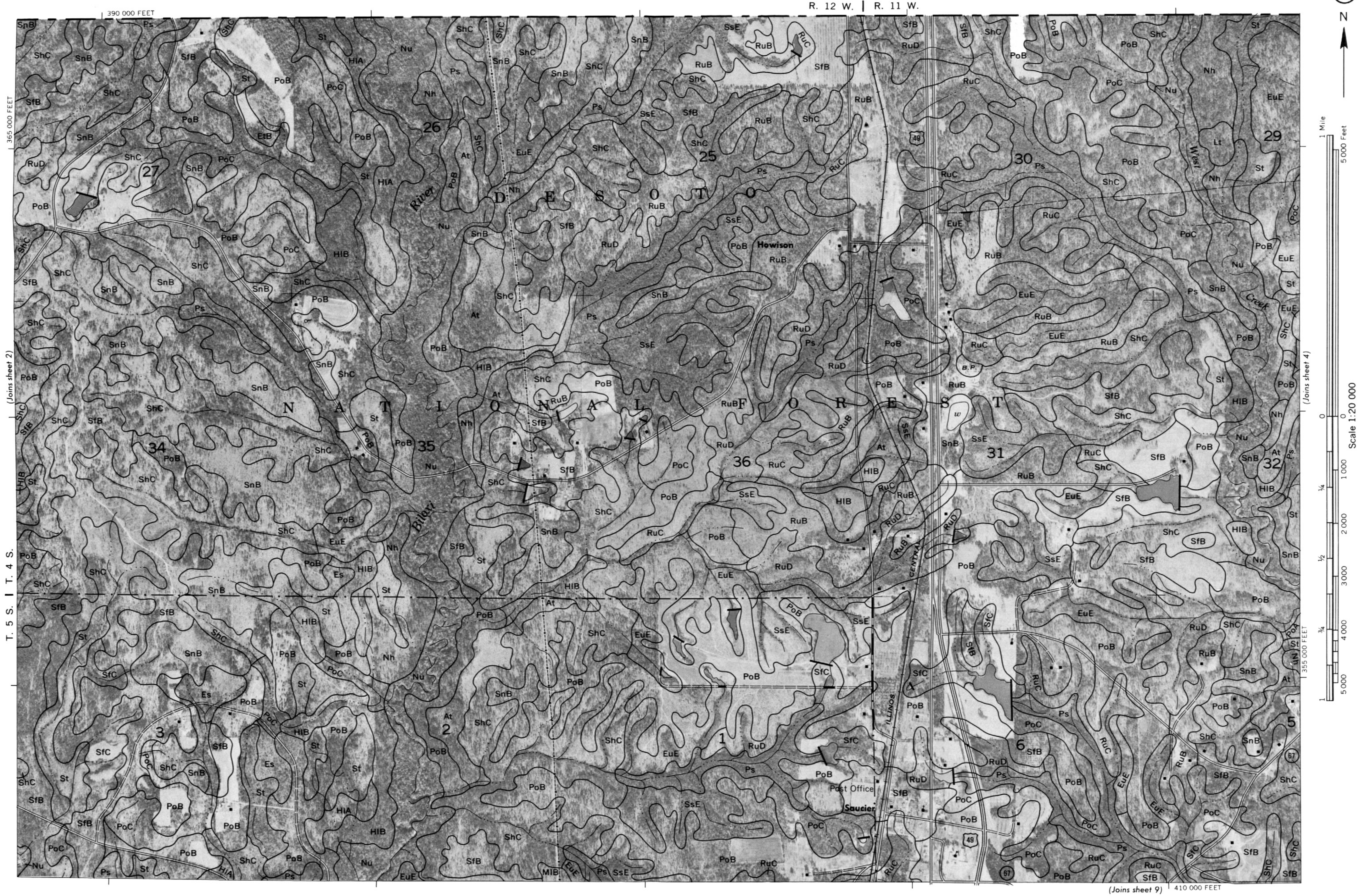

HARRISON COUNTY, MISSISSIPPI NO. 3

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Land division corners are approximately positioned on this map.

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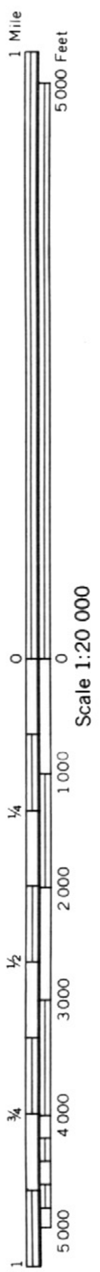
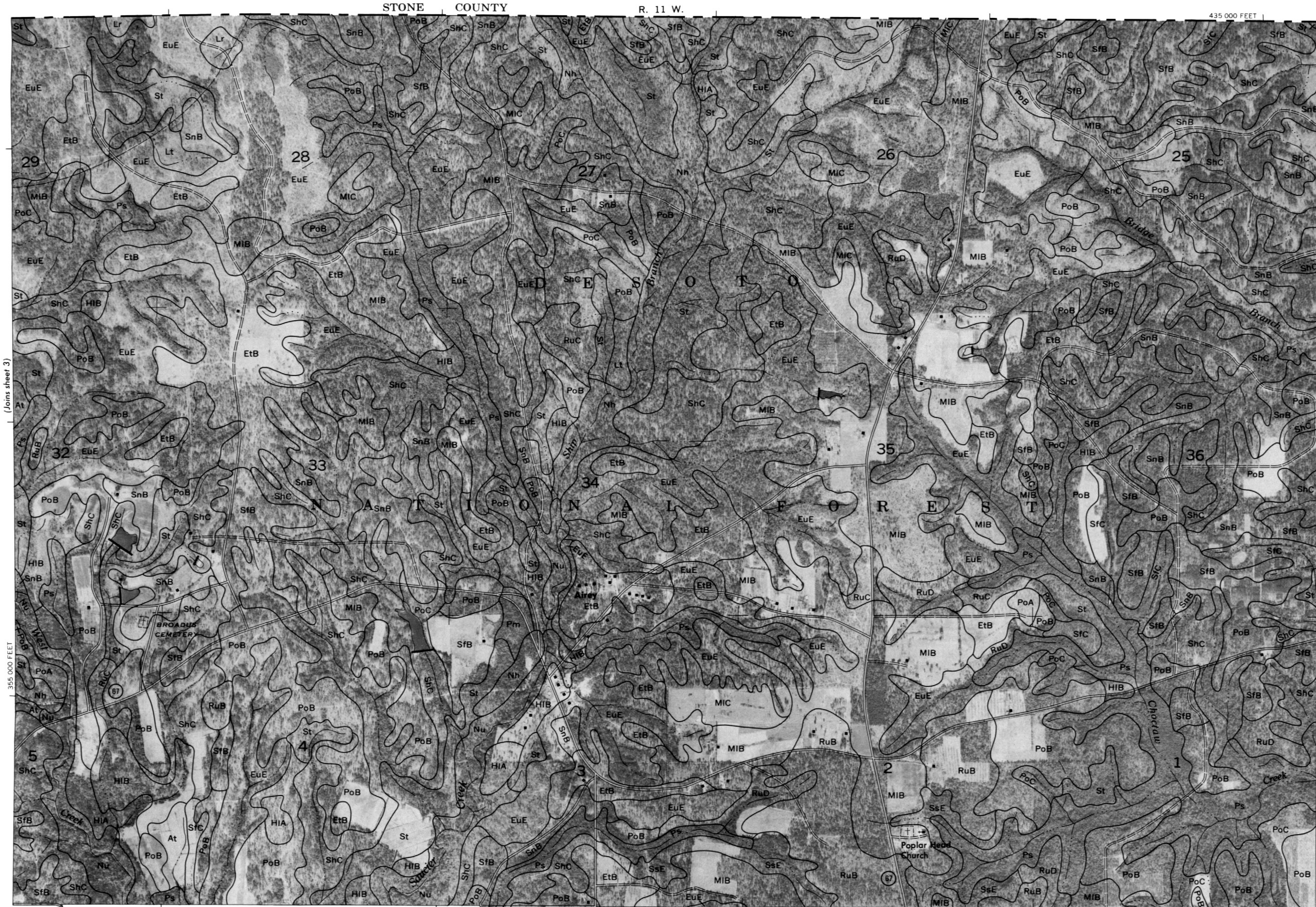
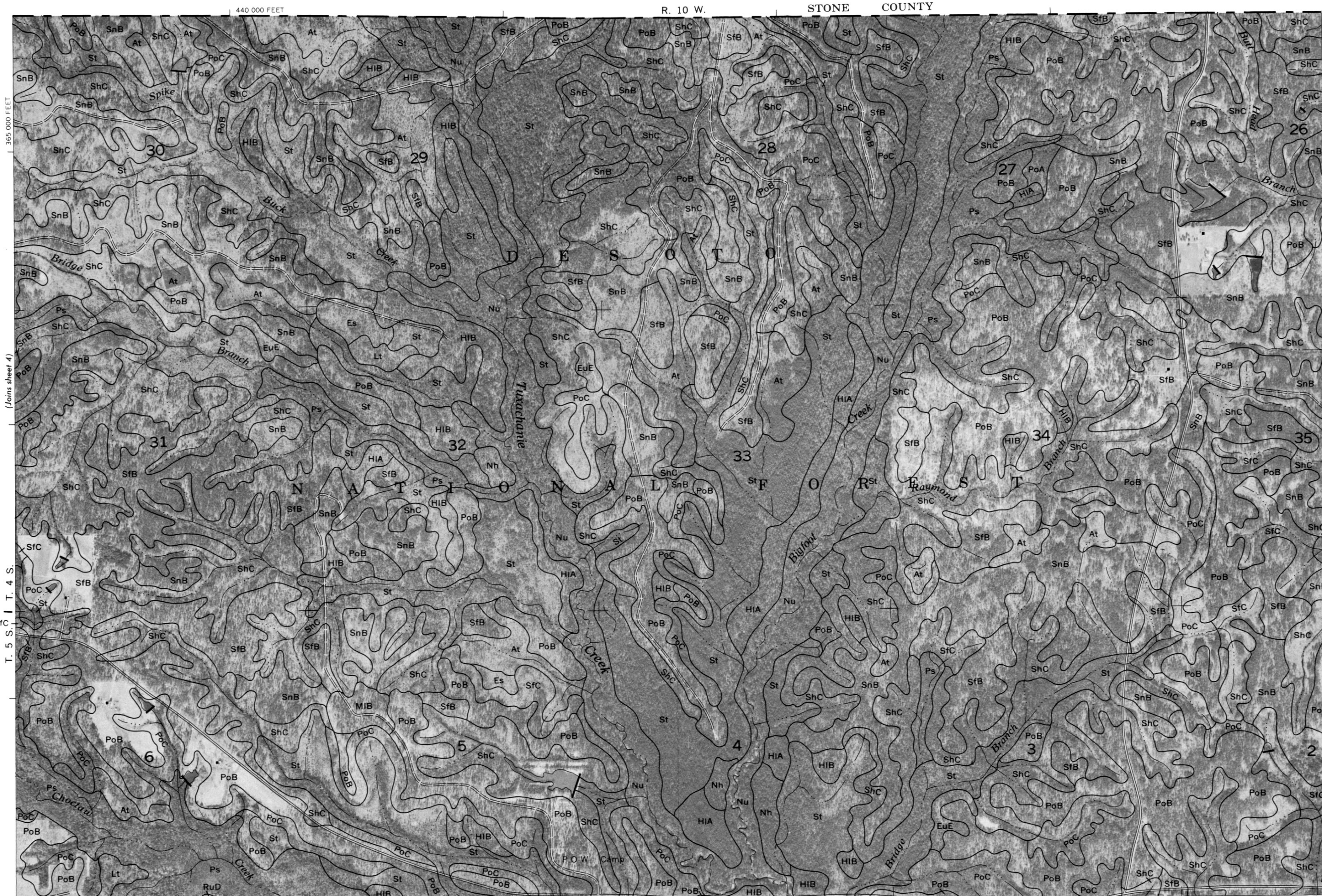
HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 4





Land division corners are approximately positioned on this map.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.



N

Scale 1:20 000

1 Mile

5000 Feet

0 1000 2000 3000 4000 5000

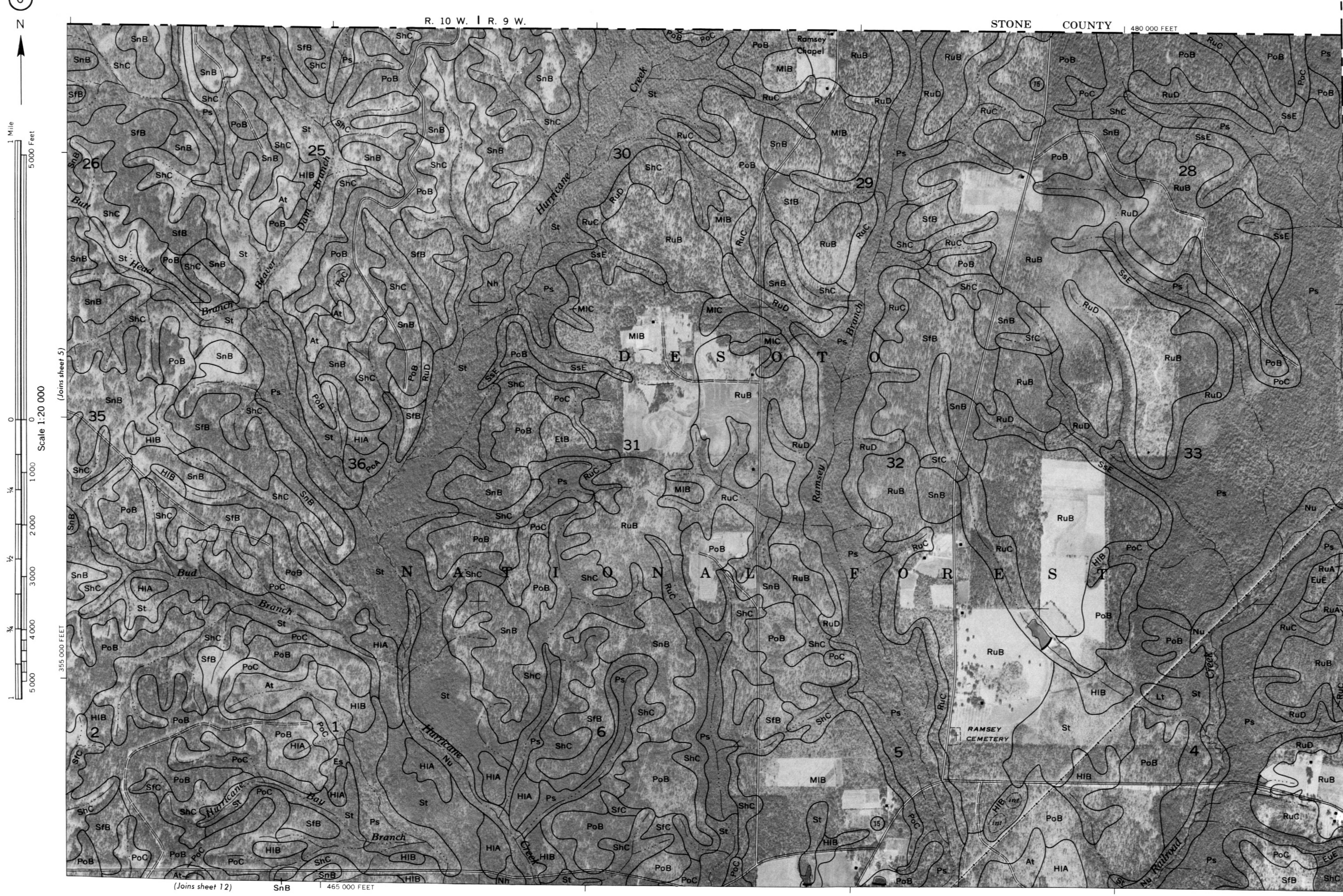
0 ¼ ½ ¾ 1

HARRISON COUNTY, MISSISSIPPI NO. 5

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.



Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

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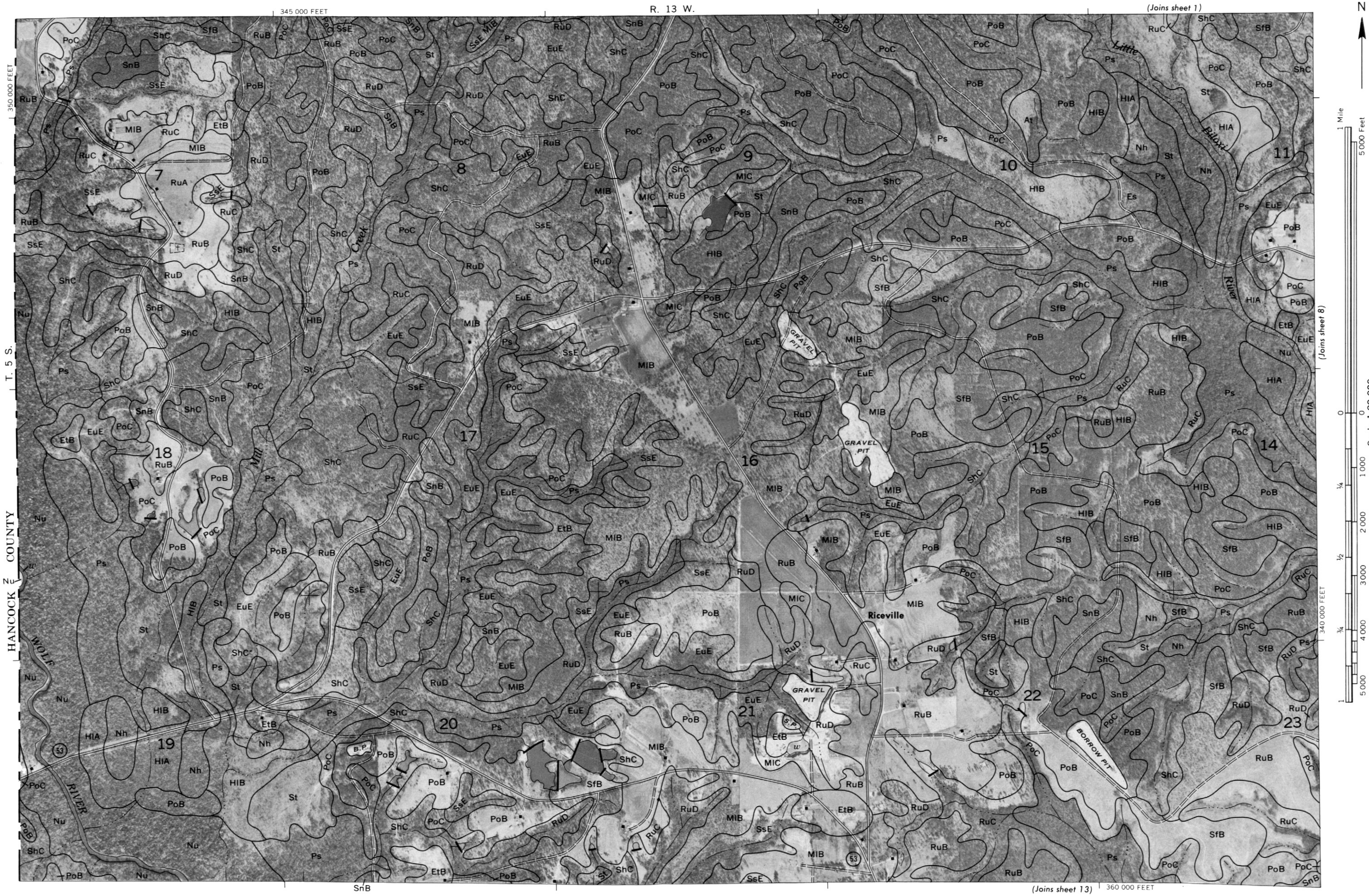
HARRISON COUNTY, MISSISSIPPI NO. 7

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.



8

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 8

N

Scale 1:20 000

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 8

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 9

HARRISON COUNTY, MISSISSIPPI NO. 9

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft grid ticks are approximate and based on the Mississippi coordinate system, east zone.

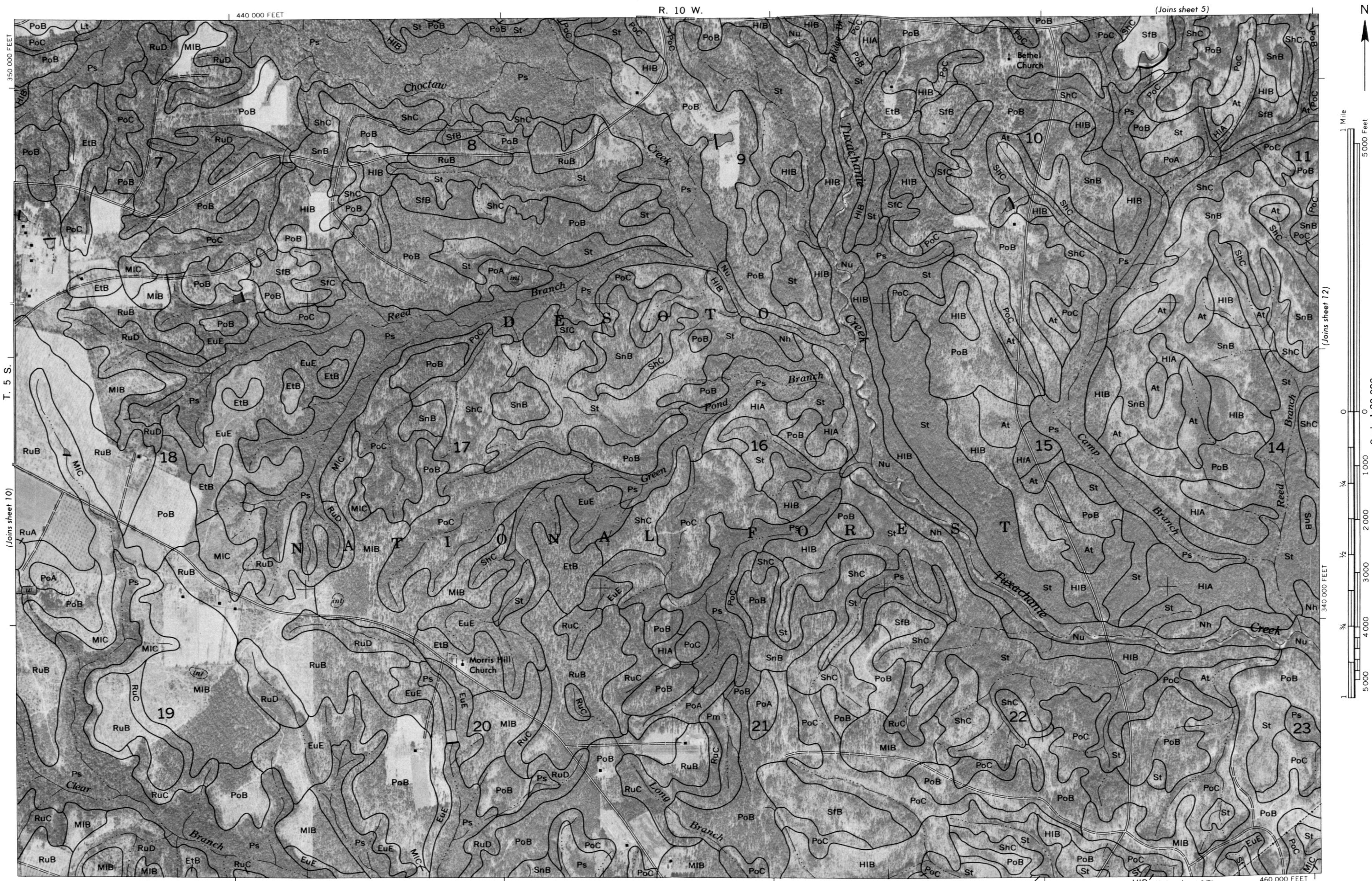
Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 10

Land division corners are approximately positioned on this map.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

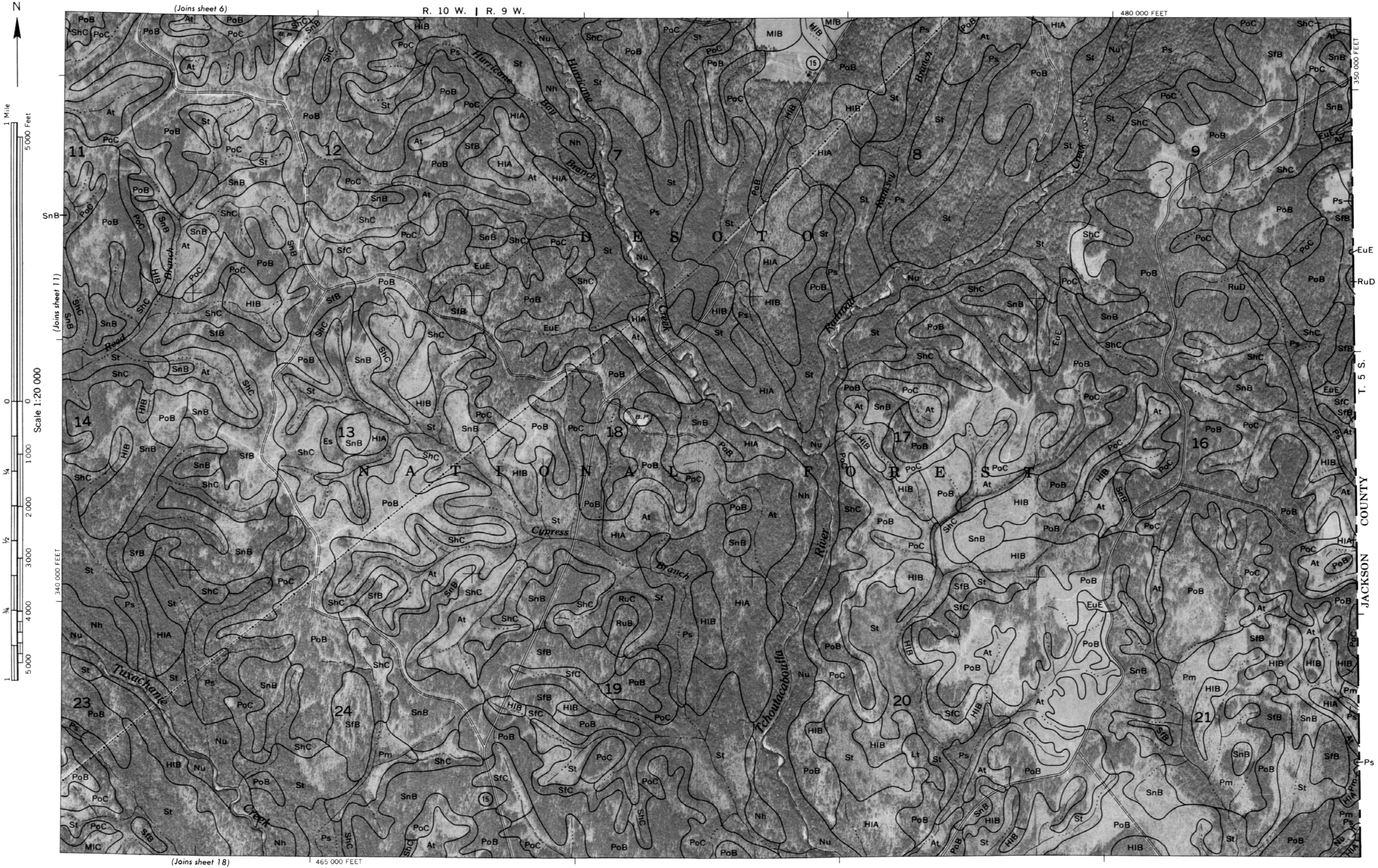
HARRISON COUNTY, MISSISSIPPI NO. 10

11

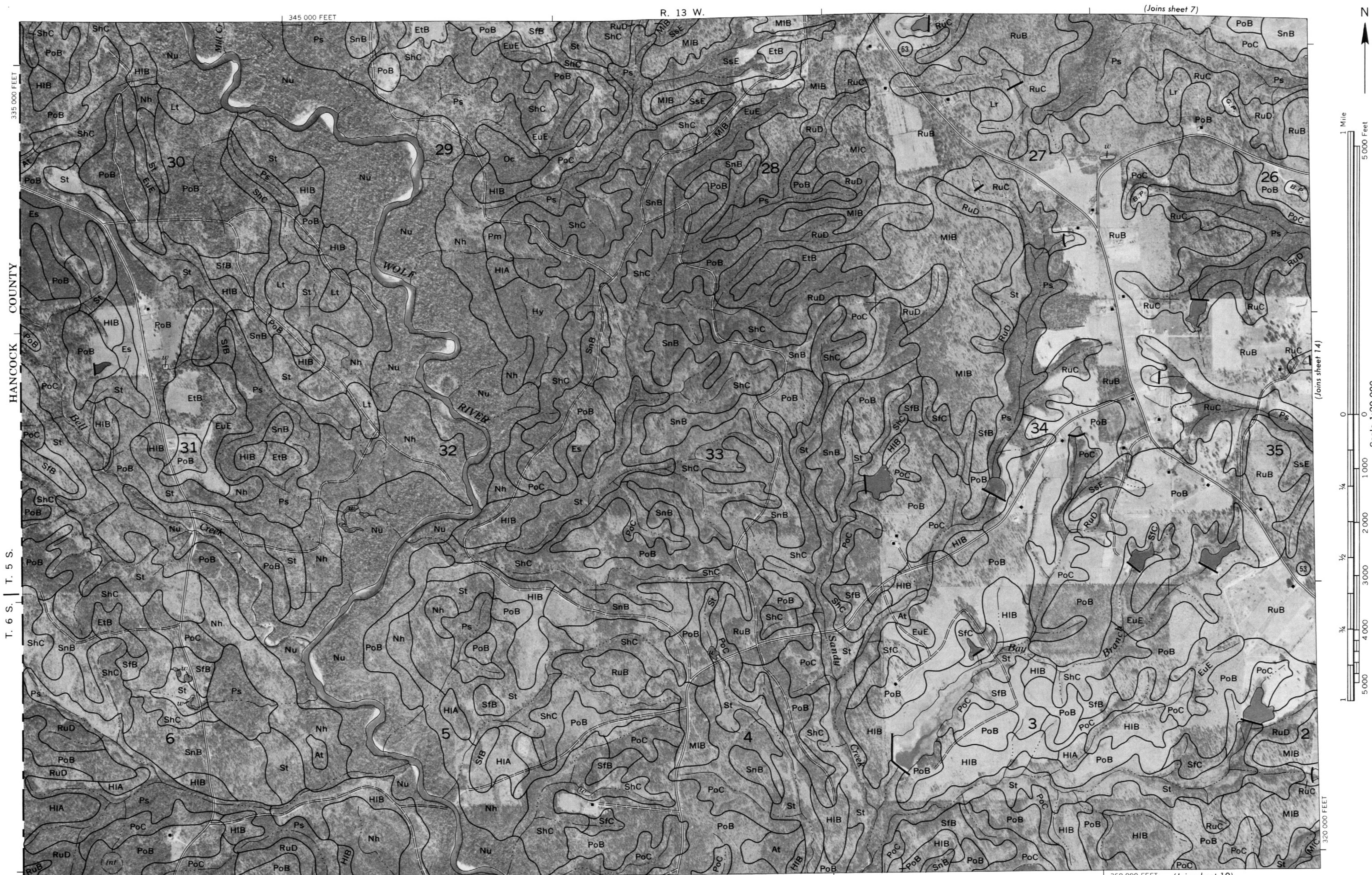


HARRISON COUNTY, MISSISSIPPI NO. 11

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.



Land division corners are approximately positioned on this map.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.



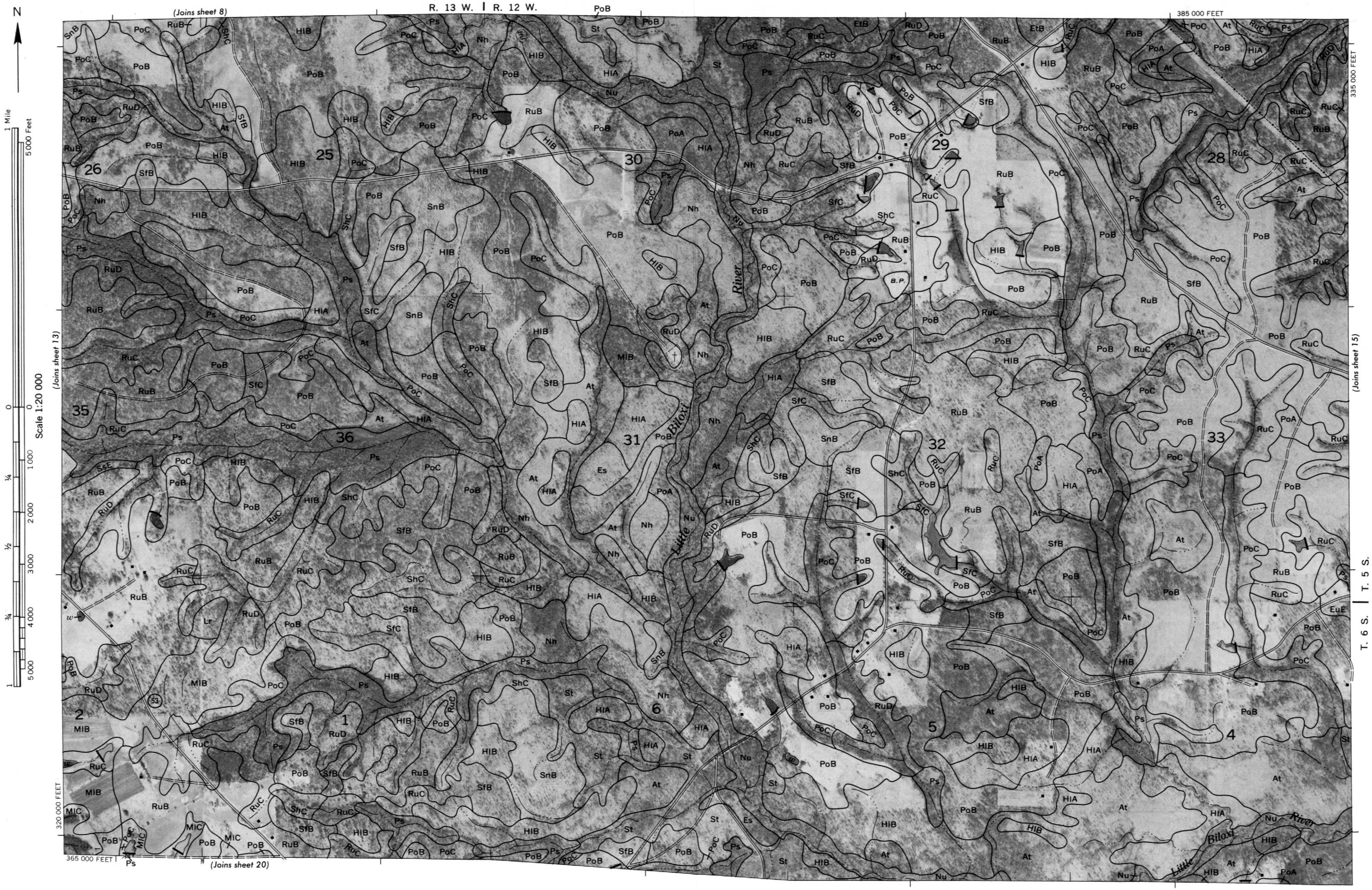
HARRISON COUNTY, MISSISSIPPI NO. 13

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 14



Land division corners are approximately positioned on this map.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
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Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.

16

N

Scale 1:20 000

1 Mile

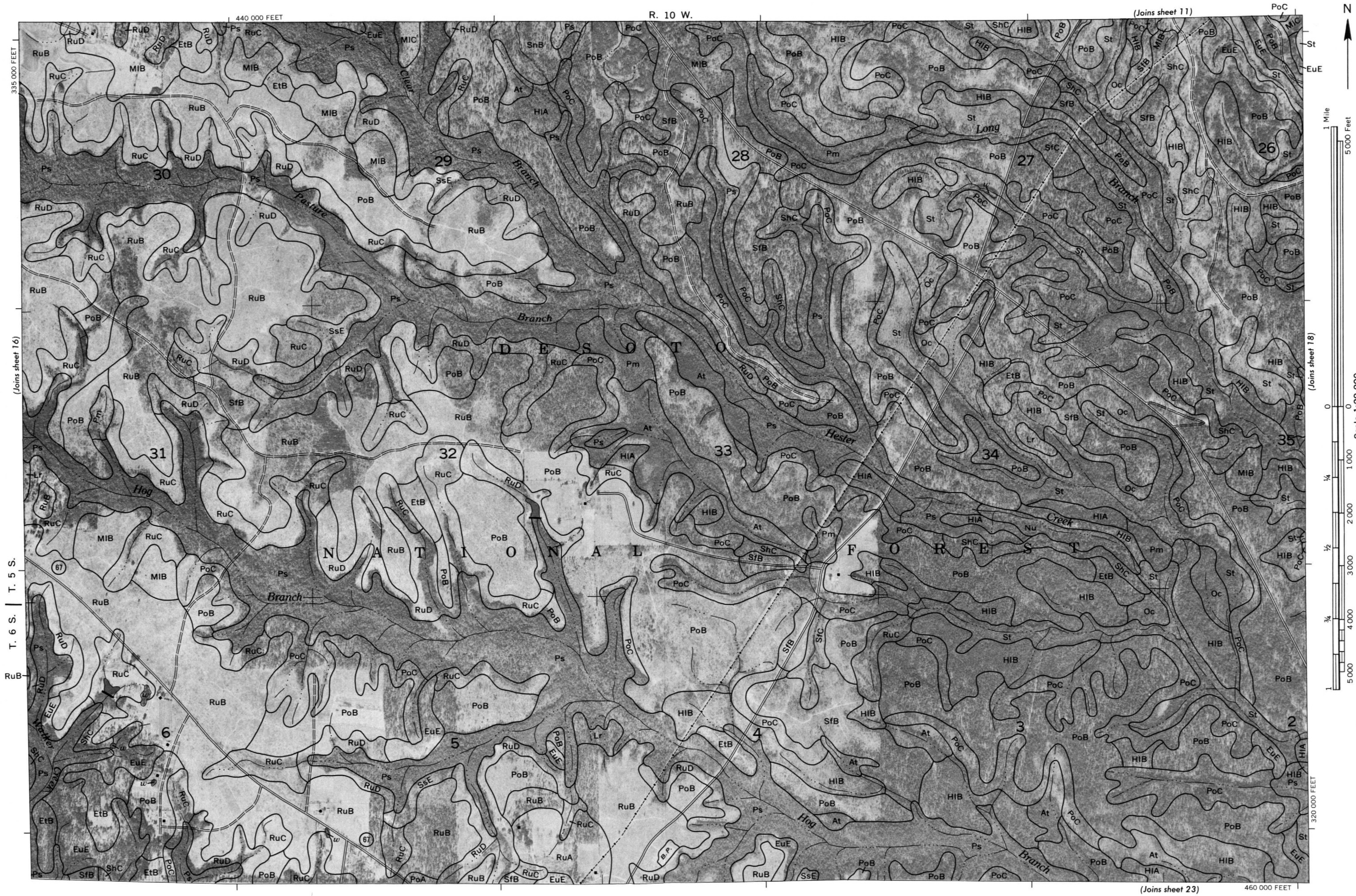
5000 Feet

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

17



HARRISON COUNTY, MISSISSIPPI NO. 17

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

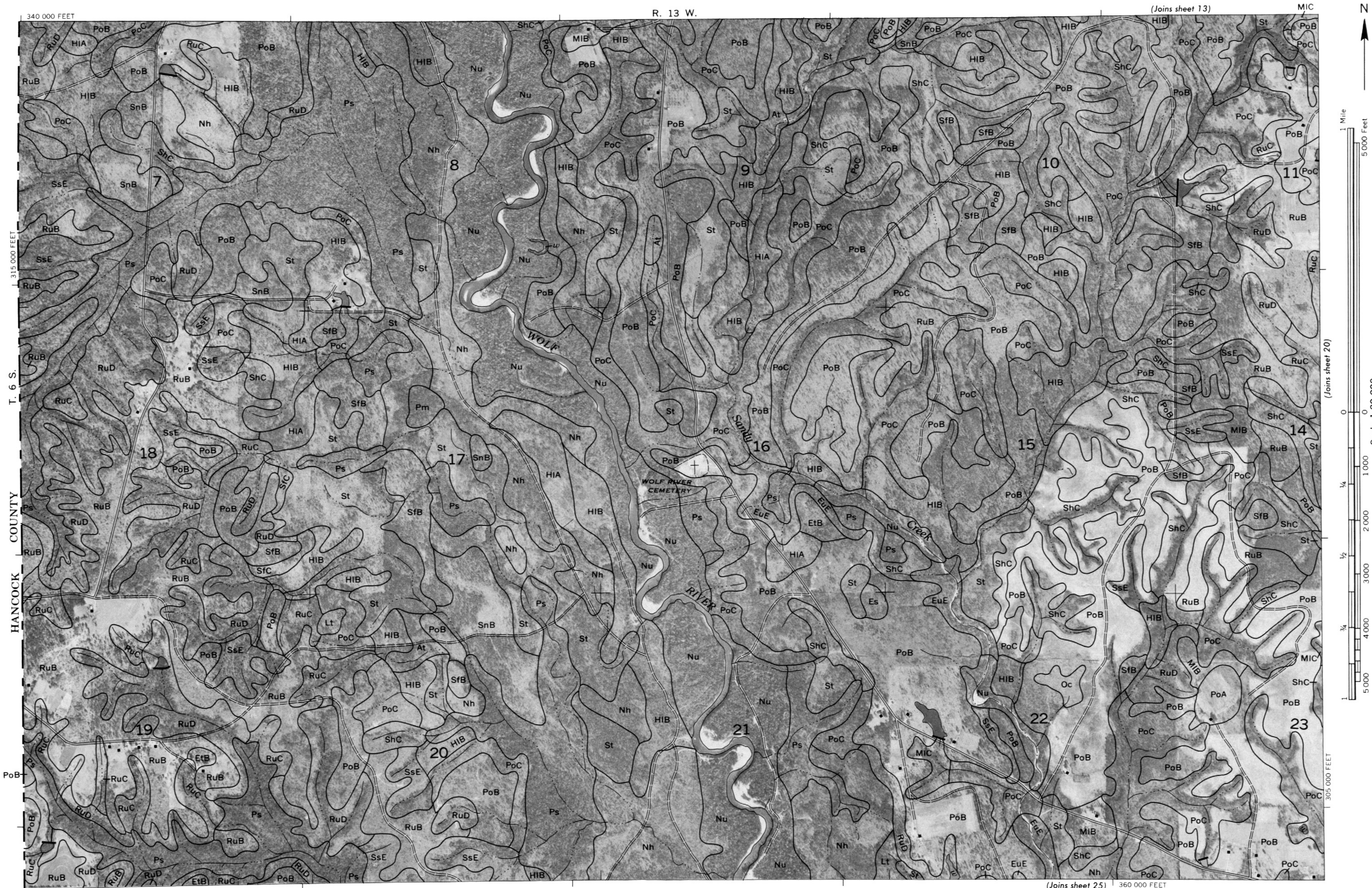
Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 18

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, and the Mississippi Agricultural and Forestry Experiment Station.



HARRISON COUNTY, MISSISSIPPI NO. 19

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 20

Land division corners are approximately positioned on this map.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 21

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

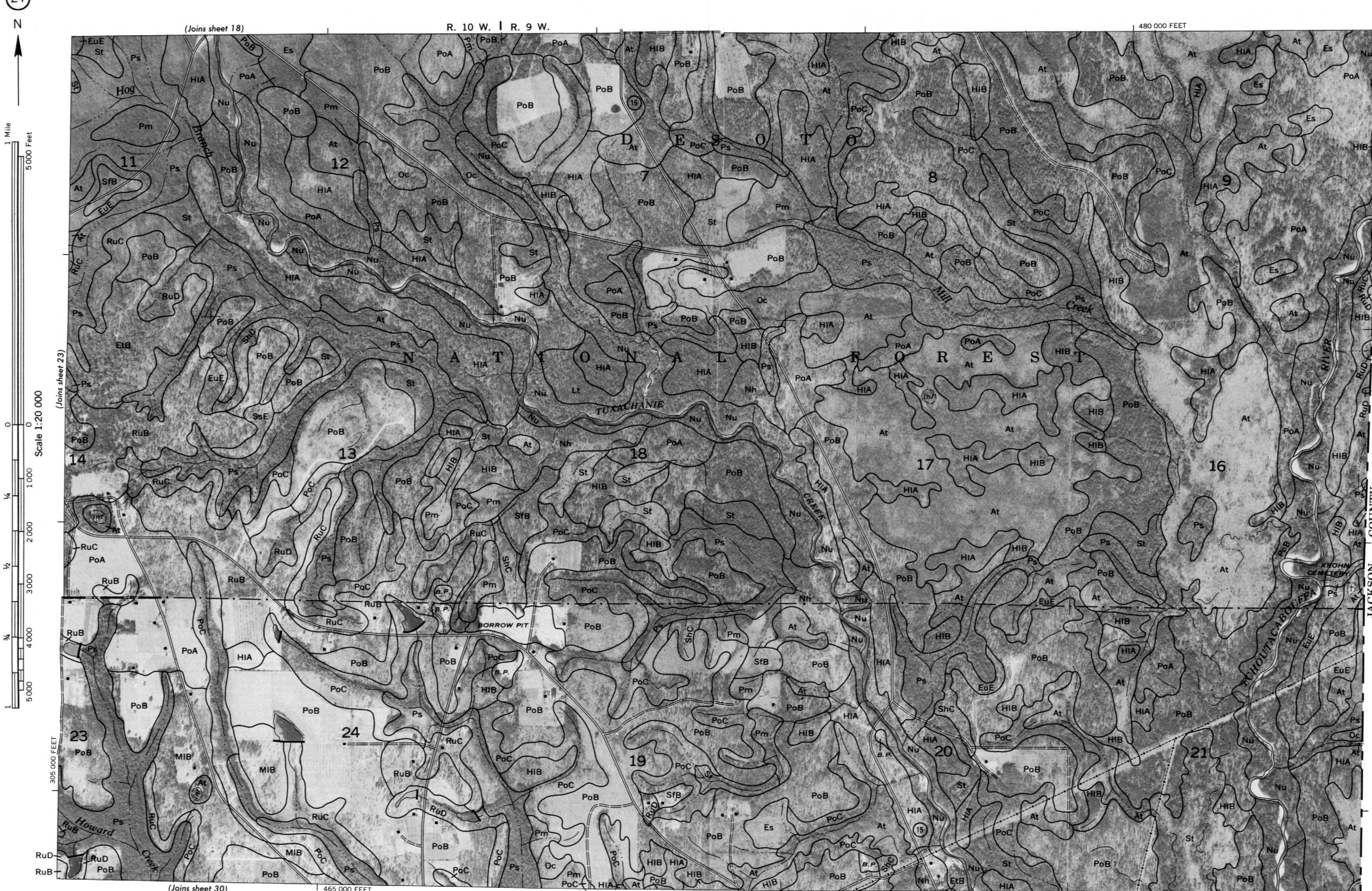
Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 22

Land division corners are approximately positioned on this map.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 23

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.



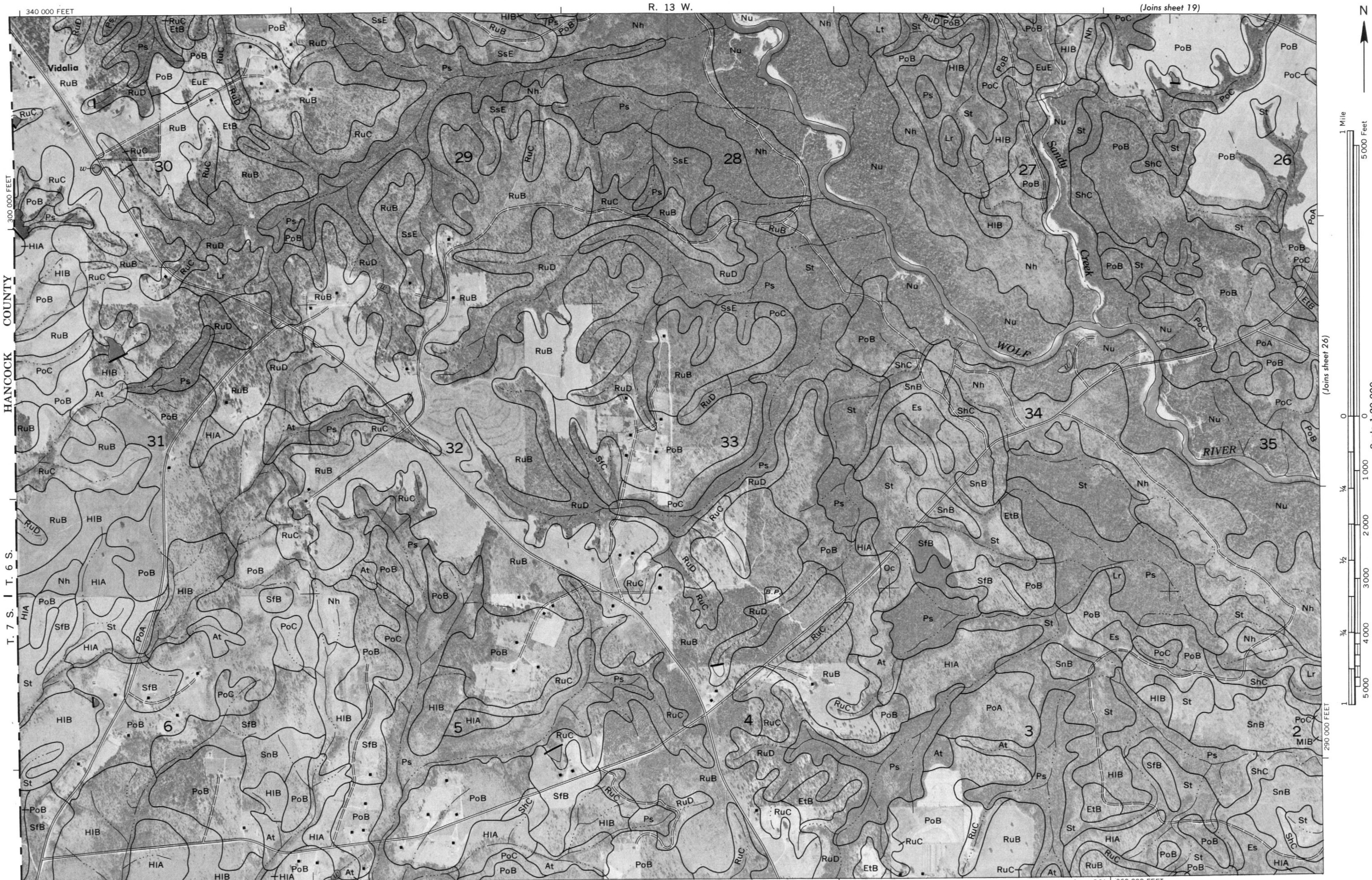
Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 25

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.



26

N

1 Mile
5 000 Feet
Scale 1:20 000
0 ¼ ½ ¾ 1
0 1000 2000 3000 4000 5000

Land division corners are approximately positioned on this map.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 26

HARRISON COUNTY, MISSISSIPPI NO. 27

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.

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Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

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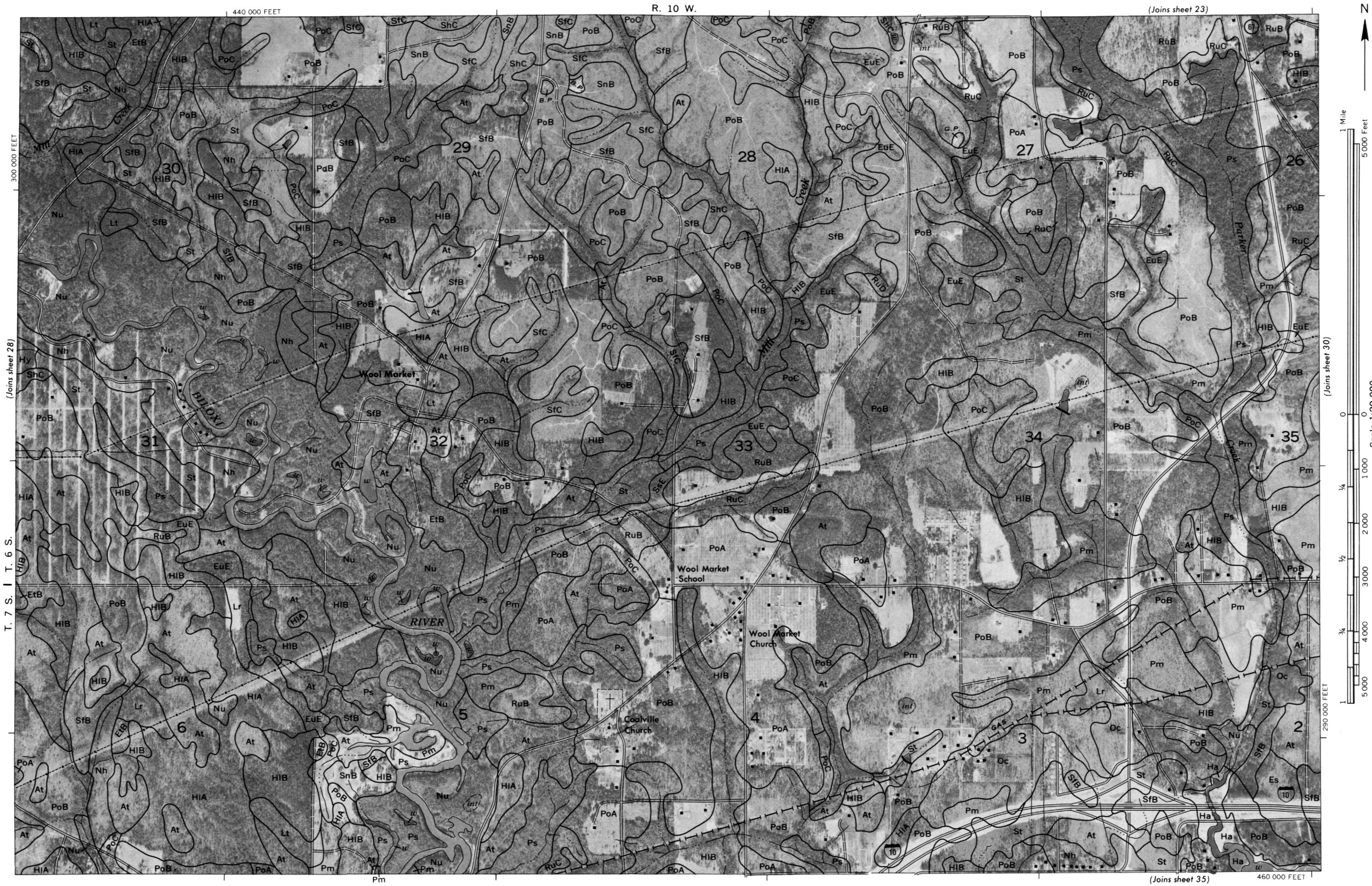

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.

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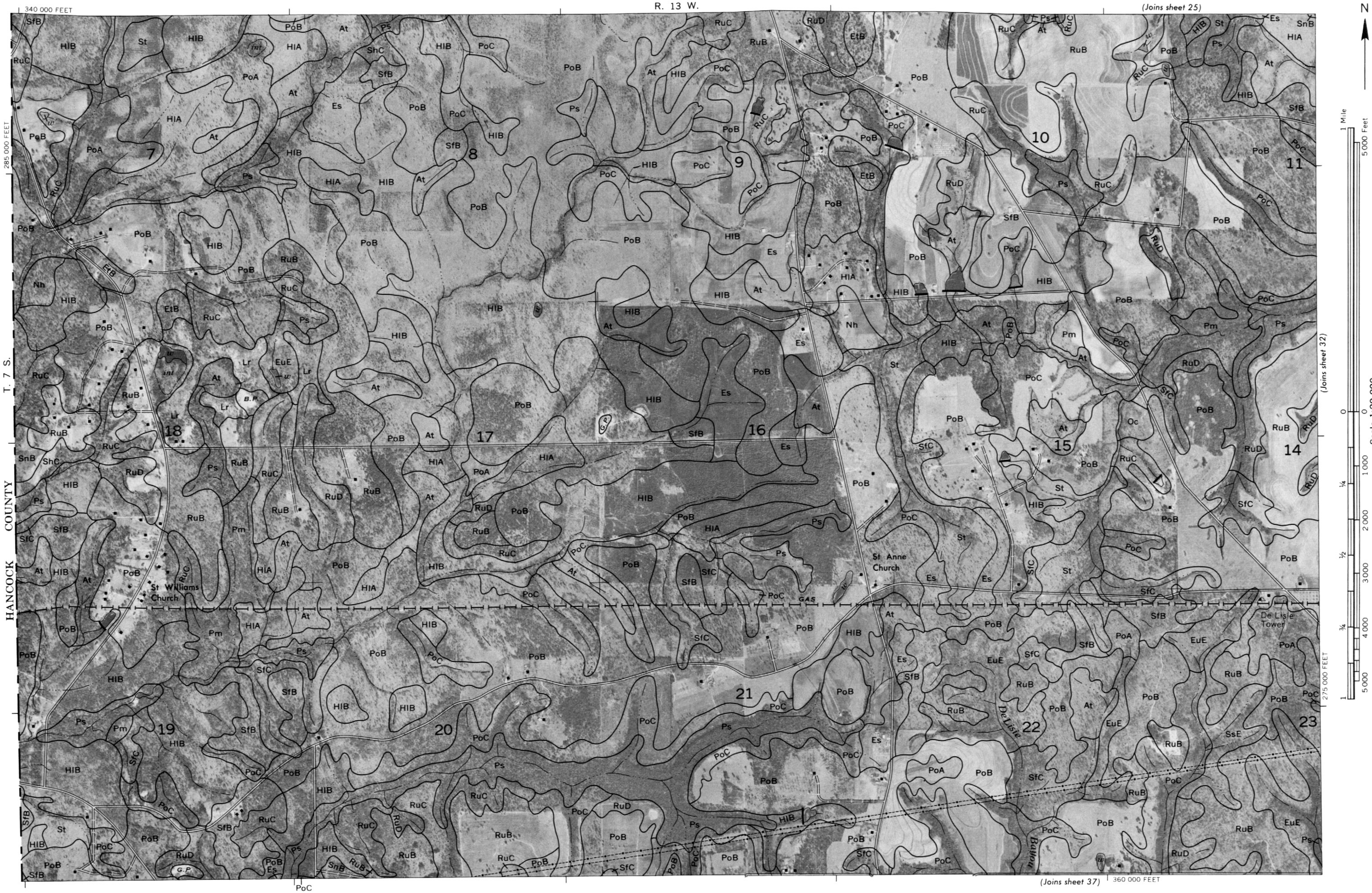


HARRISON COUNTY, MISSISSIPPI NO. 31

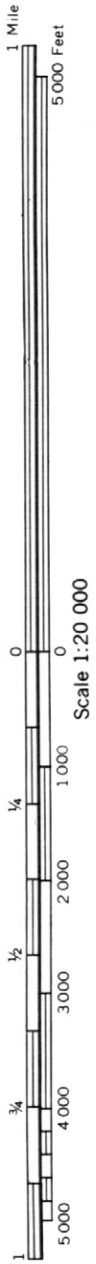
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 32

N



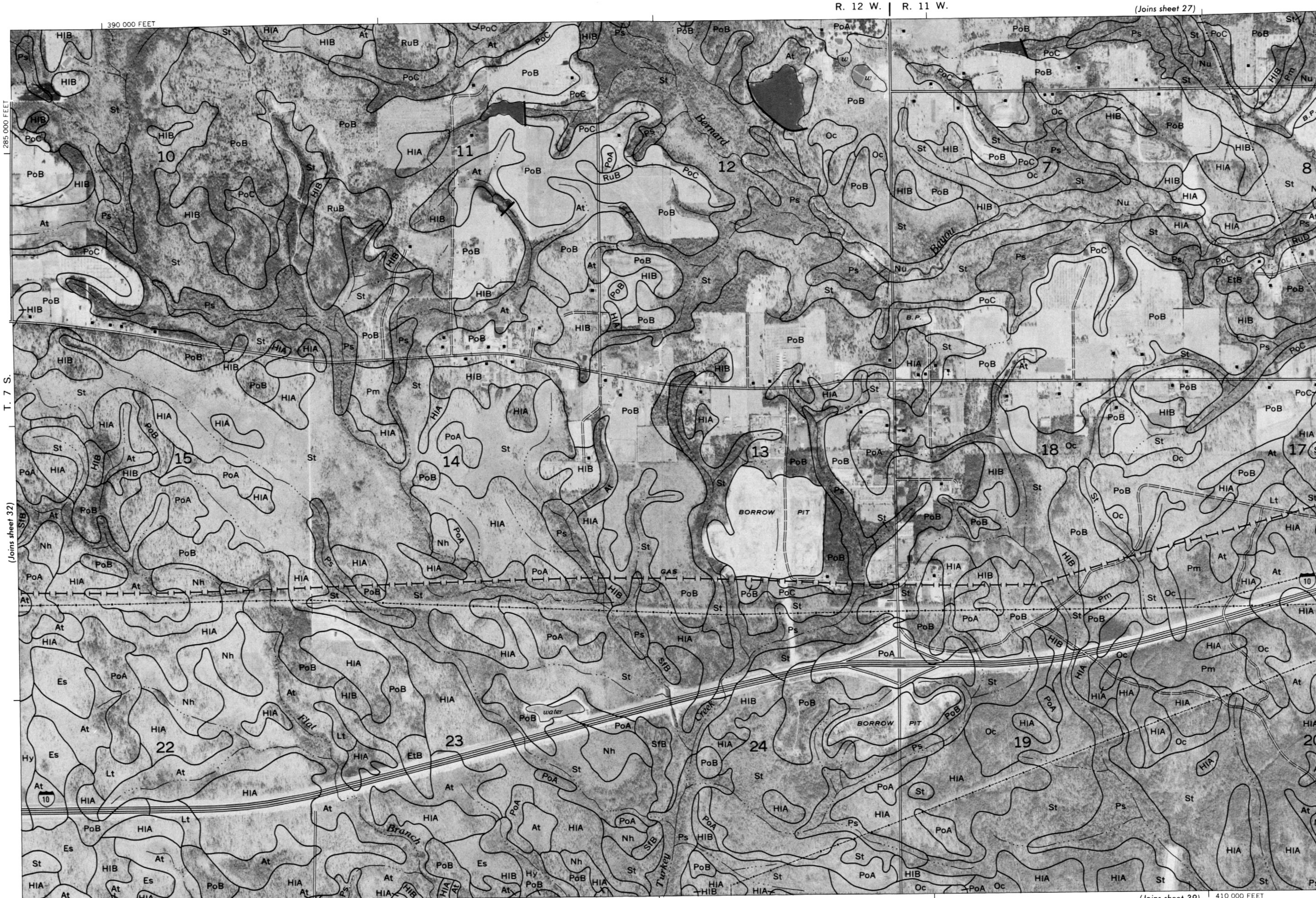
Scale 1:20 000

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

N



Scale 1:20 000

1 Mile | 0 | ¼ | ½ | ¾ | 1

5000 Feet | 0 | 1000 | 2000 | 3000 | 4000 | 5000

HARRISON COUNTY, MISSISSIPPI NO. 33

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 34

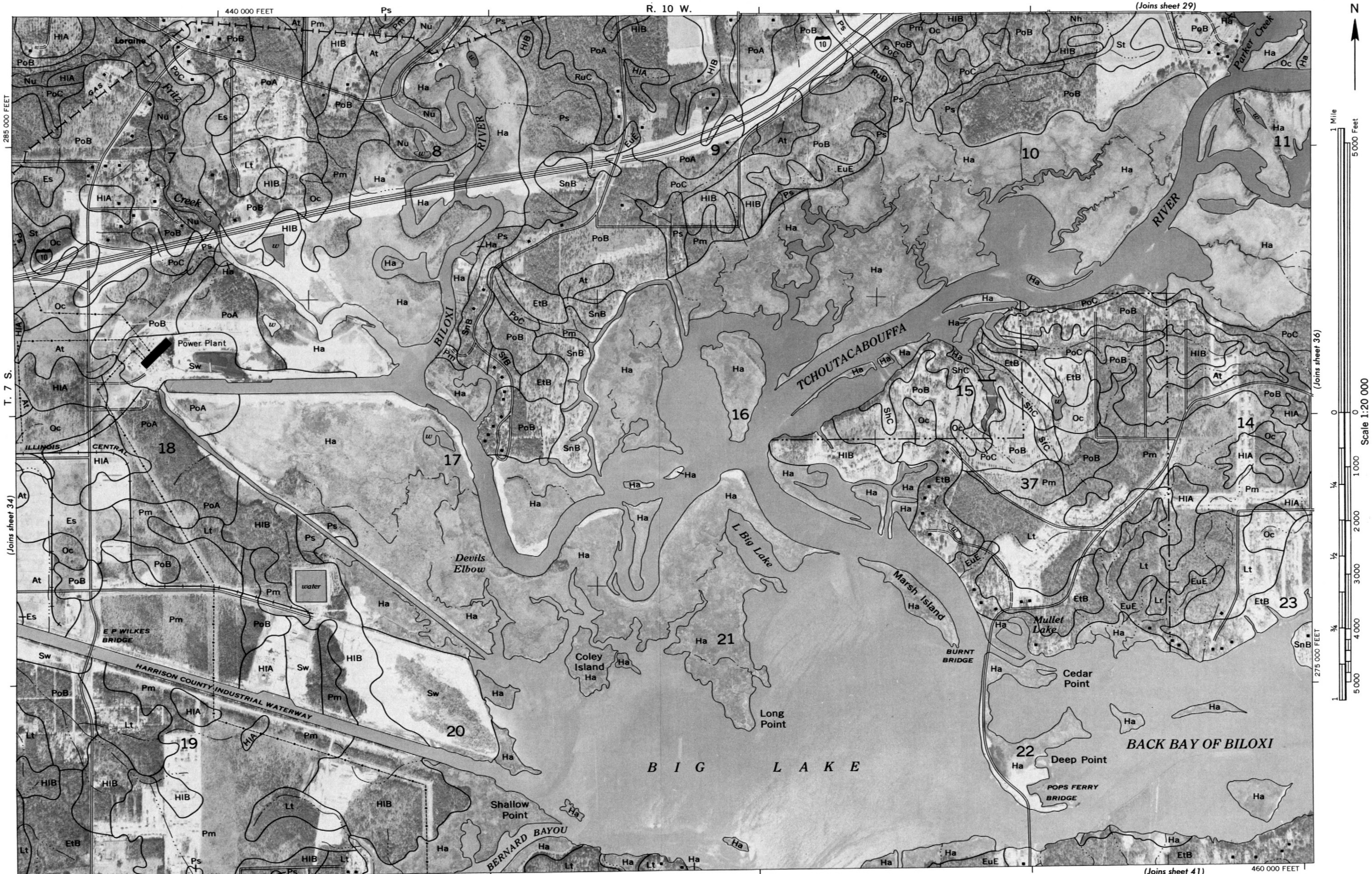
Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 34

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.



HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 36

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 37

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.

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Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

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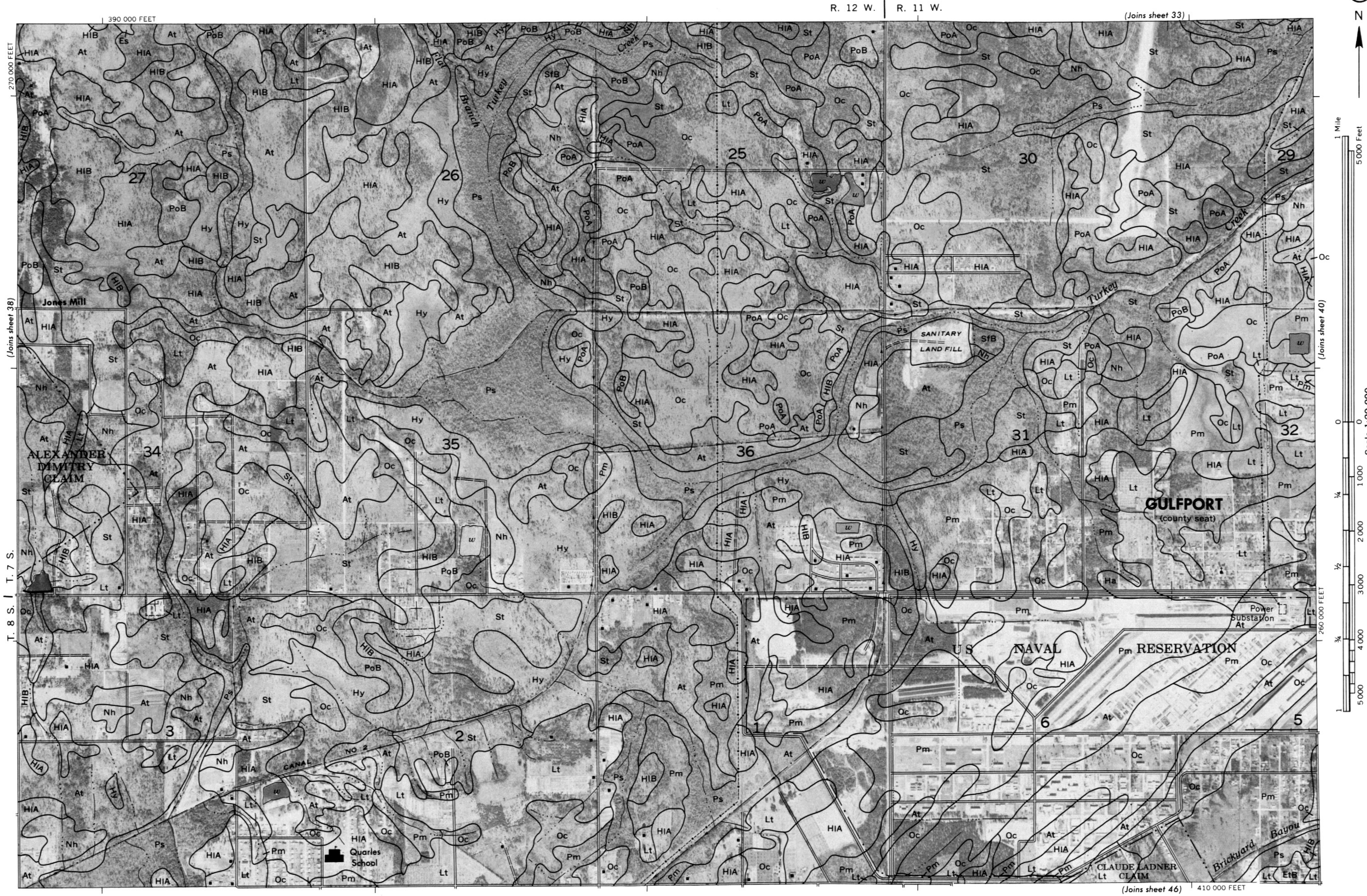


HARRISON COUNTY, MISSISSIPPI NO 39

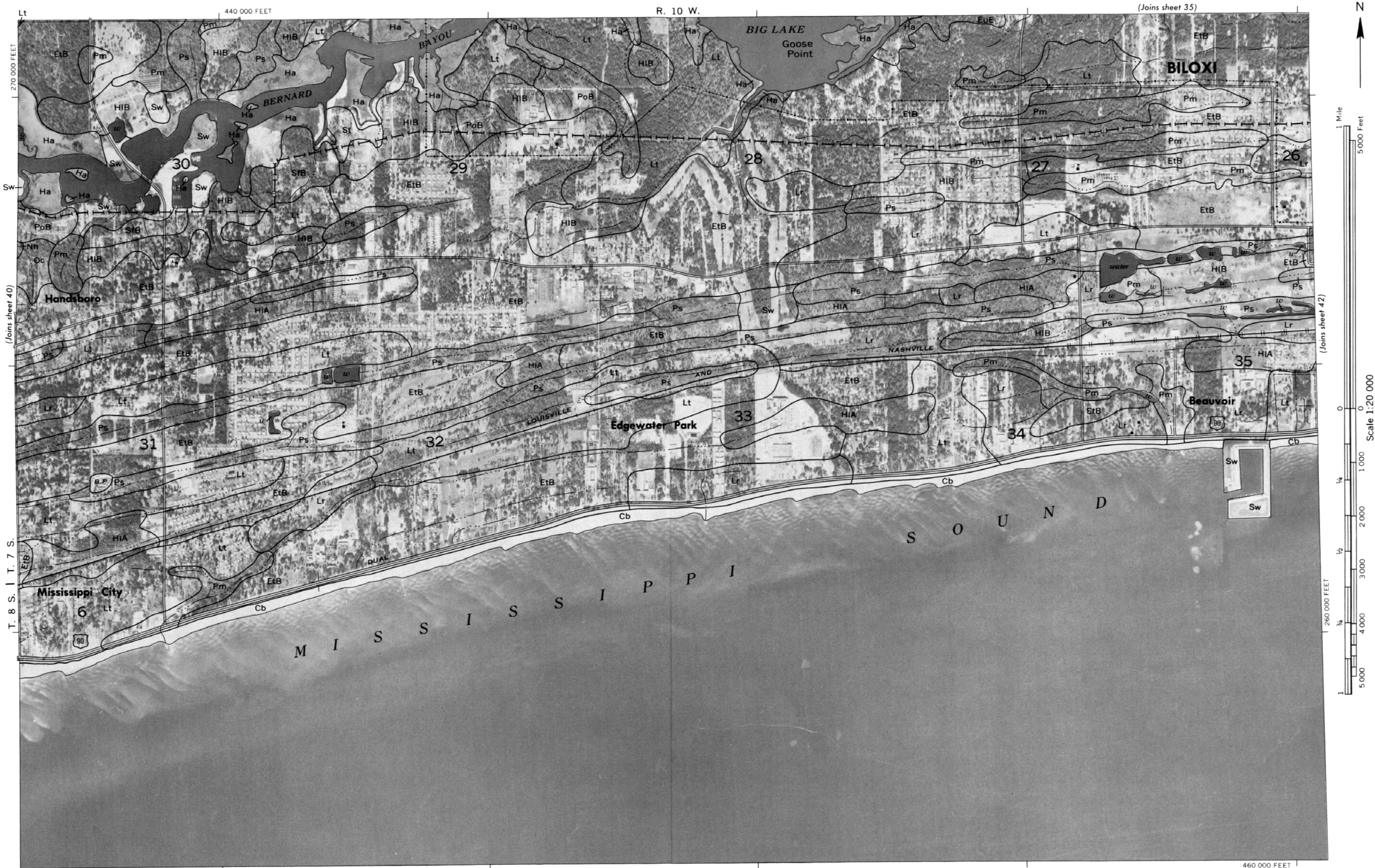
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 40

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.



HARRISON COUNTY, MISSISSIPPI NO. 41

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 42

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

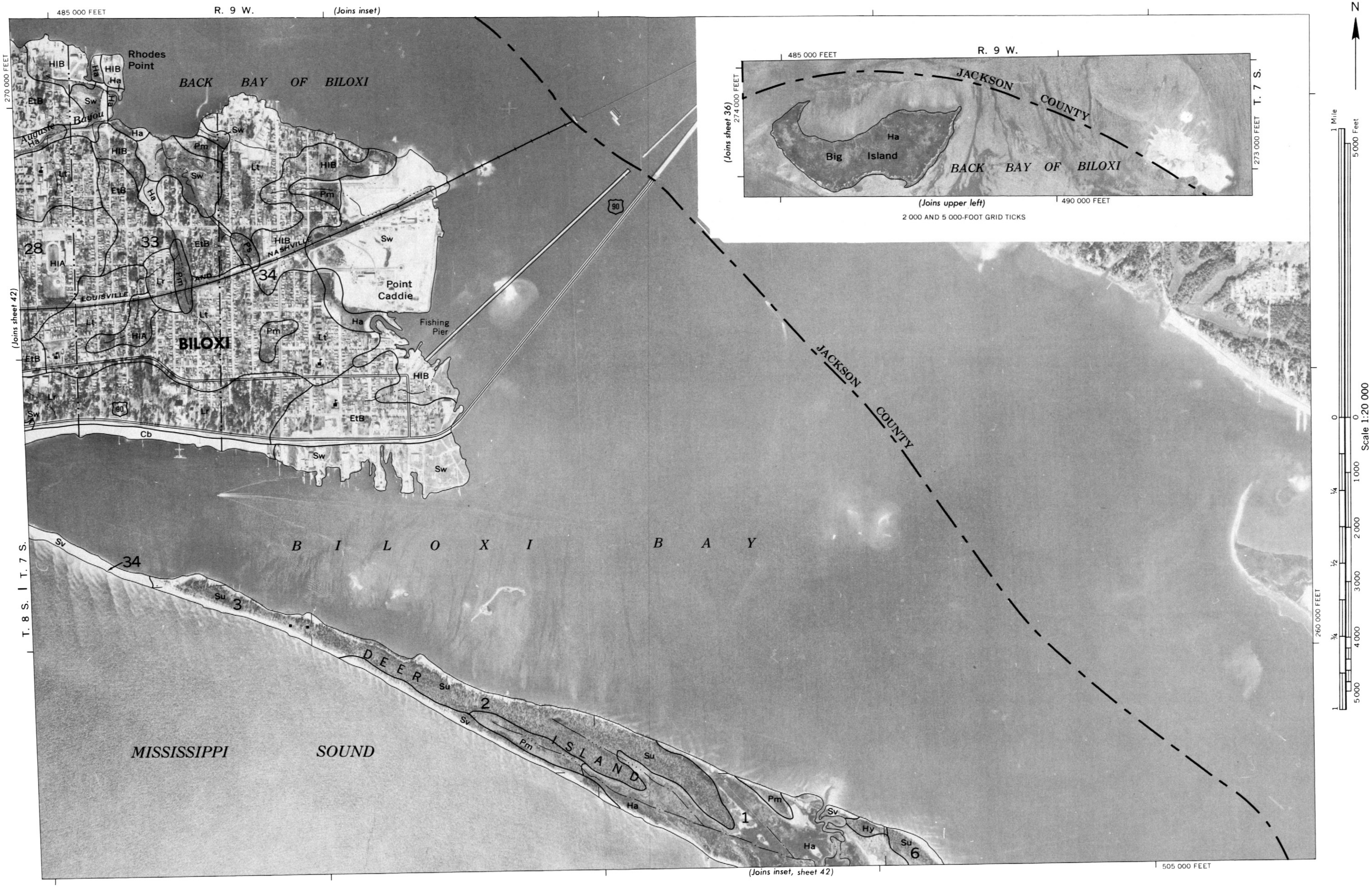
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 43

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.



Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

N

1 Mile
5000 Feet
Scale 1:20 000

HARRISON COUNTY, MISSISSIPPI NO. 45

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
Land division corners are approximately positioned on this map.

HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 46

Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

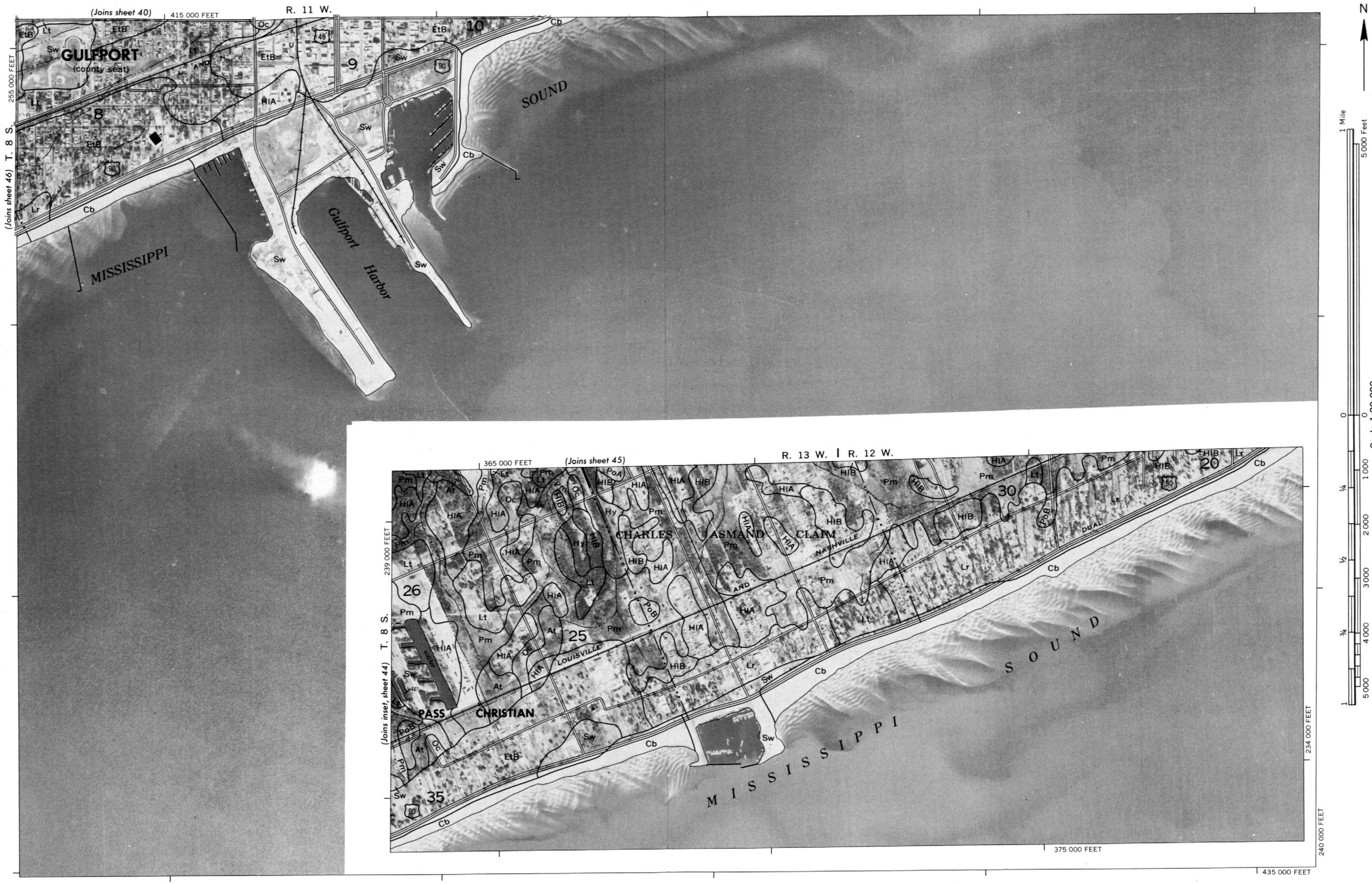
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

HARRISON COUNTY, MISSISSIPPI NO. 47

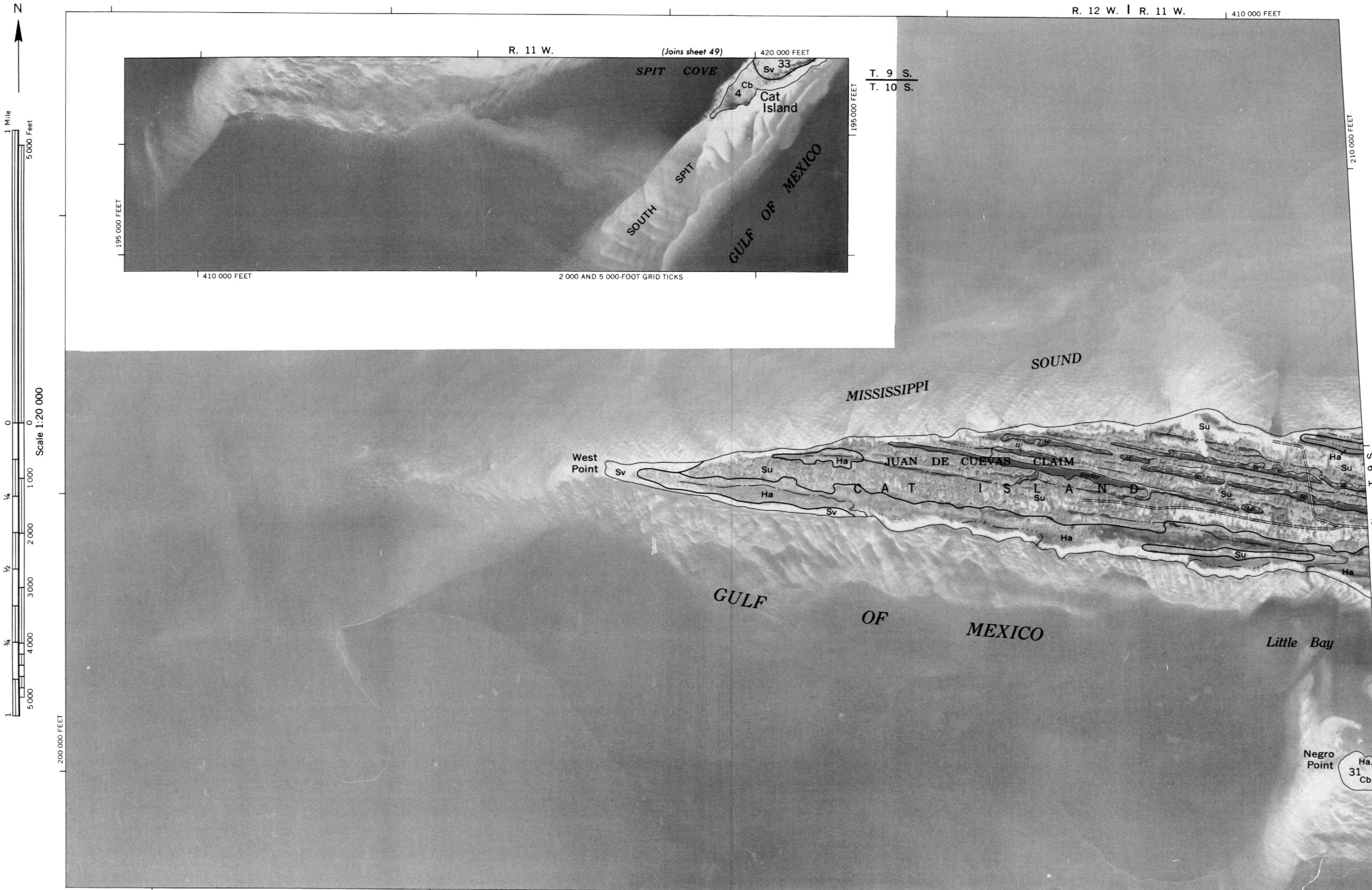
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.



HARRISON COUNTY, MISSISSIPPI — SHEET NUMBER 48



Land division corners are approximately positioned on this map.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

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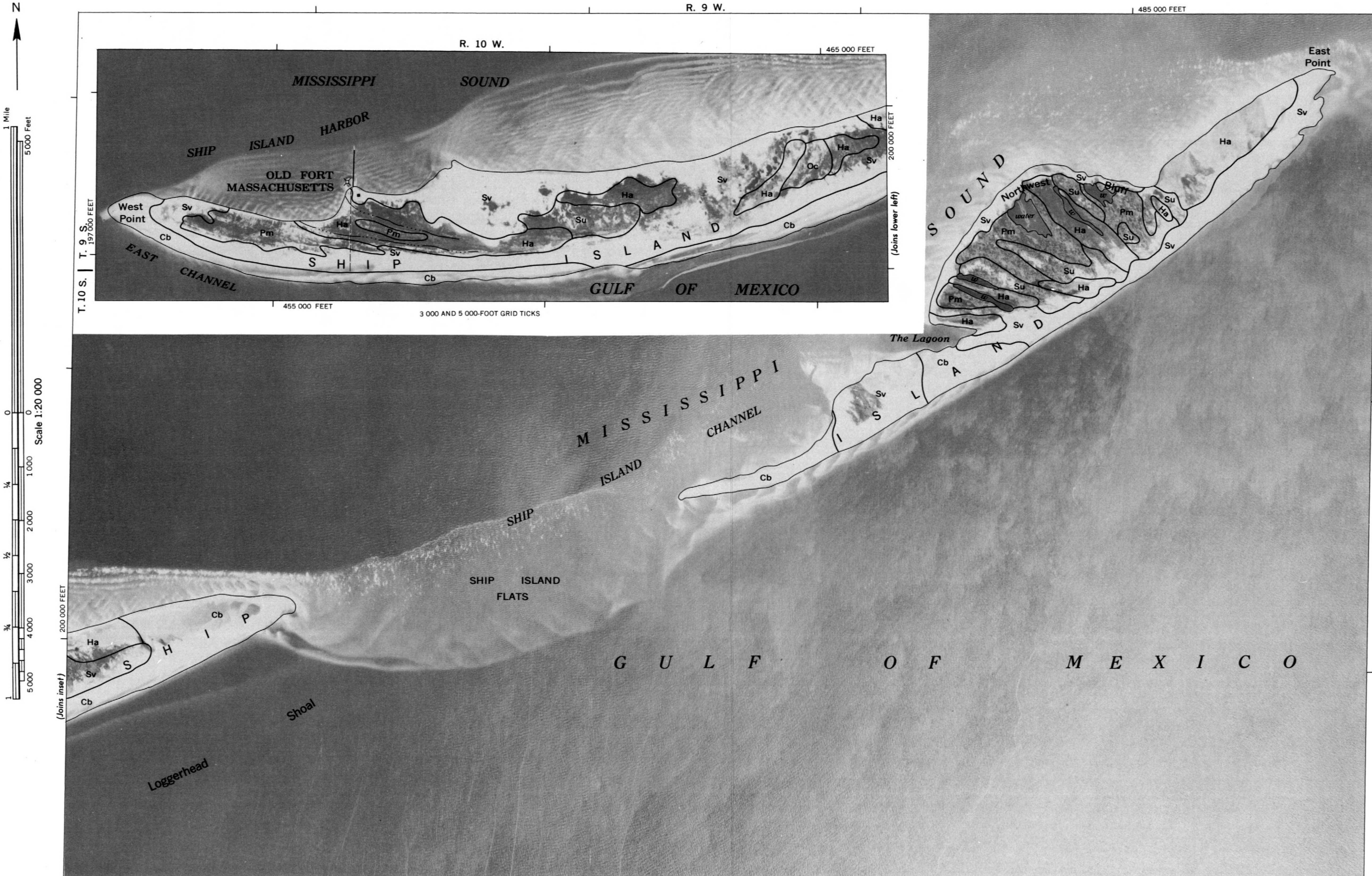
HARRISON COUNTY, MISSISSIPPI NO. 49

This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.

Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.

Land division corners are approximately positioned on this map.



Land division corners are approximately positioned on this map.
Photobase from 1972 aerial photography. Positions of 5,000-ft. grid ticks are approximate and based on the Mississippi coordinate system, east zone.
This map is one of a set compiled in 1973 as part of a soil survey by the United States Department of Agriculture, Soil Conservation Service, Forest Service, and the Mississippi Agricultural and Forestry Experiment Station.